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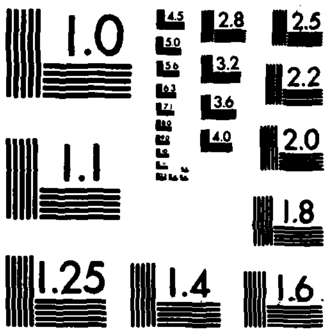

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AFAMRL-TR-83-020

COMPUTER PROGRAMS FOR PRODUCING SINGLE-EVENT AIRCRAFT NOISE DATA FOR SPECIFIC ENGINE POWER AND METEOROLOGICAL CONDITIONS FOR USE WITH USAF COMMUNITY NOISE MODEL (NOISEMAP)

HENRY T. MOHLMAN

UNIVERSITY OF DAYTON RESEARCH INSTITUTE
300 COLLEGE PARK AVENUE
DAYTON, OHIO 45469

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AIR FORCE AEROSPACE MEDICAL RESEARCH LABORATORY
AEROSPACE MEDICAL DIVISION
AIR FORCE SYSTEMS COMMAND
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

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The Air Force community noise prediction model (NOISEMAP) is used to describe the aircraft noise exposure around airbases and thereby aid airbase planners to minimize exposure and prevent community encroachment which could limit mission effectiveness of the installation. This report documents two computer programs (OMEGA 10 and OMEGA 11) which were developed to prepare aircraft flight and ground runup noise data for input to NOISEMAP. OMEGA 10 is for flight operations and OMEGA 11 is for aircraft ground runups. All

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routines in each program are documented at a level useful to a programmer working with the code or a reader interested in a general overview of what happens within a specific subroutine. Both programs input normalized, reference aircraft noise data; i.e., data at a standard reference distance from the aircraft, for several fixed engine power settings, a reference airspeed and standard day meteorological conditions. Both programs operate on these normalized, reference data in accordance with user-defined, non-reference conditions to derive single-event noise data for 22 distances (200 to 25,000 feet) in a variety of physical and psycho-acoustic metrics. These outputs are in formats ready for input to NOISEMAP.

SUMMARY

This report documents the OMEGA 10 and OMEGA 11 programs which were developed to prepare flight and ground run-up noise data for input to NOISEMAP, the Air Force community noise exposure prediction program. All routines in each program are documented at a level useful to a programmer working with the code or a reader interested in a general overview of what happens within a specific subroutine.

Both the OMEGA 10 and the OMEGA 11 programs input reference aircraft noise data from the NOISEFILE 4 database. This NOISEFILE 4 database contains reference datasets for both flyover and ground run-up operations for almost all current military aircraft. There are typically three to six flyover and ground run-up datasets for each aircraft where each dataset defines a different engine power setting. The flyover datasets contain seven mean single event measures plus the mean sound pressure level spectrum of peak perceived noise level (PNLM), all normalized to a minimum slant range of 1000 feet, a surface temperature of 59°F and a surface relative humidity of 70%. Each flyover dataset is also normalized to a specific reference airspeed which varies depending on the type of aircraft and the power condition. The ground run-up datasets contain 19 farfield sound pressure level spectra measured at 10 degree increments at a fixed radial distance around one side of the aircraft. These ground run-up data are normalized to a fixed radial distance of 250 feet and to standard day meteorological conditions (59°F, 29.92 inches Hg, 70% relative humidity). The format and content of these normalized reference flight and ground run-up data are defined in Appendices E and G, respectively.

The OMEGA 10 program inputs reference flyover datasets from NOISEFILE 4 database for a specific aircraft, and extrapolates the reference sound pressure level (SPL) data from the reference minimum slant range (1000 feet) to 22 profile distances (200 to 25000 feet), computes the single event measures at these distances, and then applies the Δ"6 rule to extrapolate or interpolate these single

event versus distance data to produce distance profiles for up to seven single event noise measures at the requested power setting, airspeed, temperature and relative humidity. The seven single event measures are A-weighted overall sound level (ALX), tone-corrected A-weighted overall sound level (ALTX), perceived noise level (PNLX), tone-corrected perceived noise level (PNLTX), sound exposure level (SELX), tone-corrected sound exposure level (SELTX) and effective perceived noise level (EPNLX). In the print mode, the profile data for all seven measures are always computed and printed and, when requested by the IPU flag, the SELX, SELTX and EPNLX data are written on the card image file. In the no-print mode, which is designed primarily to prepare data for input to the NOISEMAP program, only the one SELX, SELTX, or EPNLX measure identified on the code sheet is written to the card image file. The content and format of these flight noise profile datasets in the card image file are given in Appendix F.

The Δ"6 rules referenced in the above paragraph describe the procedure required to interpolate and/or extrapolate the OMEGA 10 profile data from the given reference data. These rules are defined in the documentation for subroutine SETUPD6.

The OMEGA 11 program inputs reference ground run-up datasets from the NOISEFILE 4 database for a specific aircraft, extrapolates these SPL spectra from the reference distance (250 feet) to each of the 22 profile distances, computes the AL, ALT, PNL and PNLT single event measures for each spectrum at each distance, and then interpolates these reference data to generate similar distance profiles for ALX, ALTX, PNLX, and PNLTX at the requested temperature, relative humidity, barometric pressure and aircraft engine power setting. As in the OMEGA 10 program above, print and punch flags are defined to control the type and quantity of data printed on the output and card image files. The format and content of these ground run-up noise profile data are described in Appendix H.

The profile datasets written in the card image files as described in the above programs are the primary aircraft noise data used by the NOISEMAP program to generate noise profiles around a specific airbase. With these programs these noise data can be tailored to the specific weather and aircraft flight and ground run-up power conditions for that airbase which will, in turn, improve the accuracy of the noise contours produced by the NOISEMAP program.

The remaining appendices in this report contain the following items for both the OMEGA 10 and OMEGA 11 programs:

(a) a complete source listing as well as a super index which lists all variable names and the routines in which they are used;

(b) the program code sheet and the procedure for setup and execution of the program;

(c) a complete sample run including a listing of all input and output data.

PREFACE

This report documents the OMEGA 10 and OMEGA 11 computer programs which were developed to prepare aircraft flyover and ground run-up data for input to the NOISEMAP program. This work was performed for the Air Force Aerospace Medical Research Laboratory at Wright-Patterson Air Force Base, Ohio. The contract monitor for this effort was Mr. John N. Cole.

Special thanks are due to Mr. John Cole and Mr. Jerry Speakman for their guidance and assistance in this effort.

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INTRODUCTION

This report contains the complete documentation of the OMEGA 10 and OMEGA 11 programs. Included in Appendices are the program source listings with a symbol versus reference listing at the end of each program (Super Index), input parameter code sheets with standard procedures for setup and execution of each program, format descriptions for all card input and output, and input and output sample test data. Both programs were written in CDC FORTRAN Extended (FORTRAN IV) for the CDC CYBER 74 and CYBER 750 in the ASD Computer Center at Wright-Patterson Air Force Base. Several non-ANSI standard features of FORTRAN Extended were used throughout both programs, for example, asterisks were used as Hollerith delimiter in format statements; however, most of the coding is in standard FORTRAN.

These programs were developed by the University of Dayton Research Institute (UDRI) and the Air Force Aerospace Medical Research Laboratory (AFAMRL) to prepare flight (OMEGA 10) and ground run-up (OMEGA 11) noise data for input to NOISEMAP, the Air Force community noise exposure prediction program. Both programs input reference datasets from the NOISEFILE 4 database and interpolate or extrapolate the profile measure data at the requested power settings and meteorological conditions. These flight and ground run-up reference data in NOISEFILE 4 were computed by the OMEGA 6 and 8 programs, respectively. Some of the analysis procedures used in these programs are described in AMRL-TR-73-107.[1]

The OMEGA 10 program inputs all flight noise reference datasets from file TAPE7 for the aircraft being analyzed. File TAPE7 was set up from NOISEFILE 4 with a CDC UPDATE run. These flight reference datasets contain seven mean single event measures plus the mean sound pressure level spectrum of perceived noise level (PNLM), all normalized to 1000 feet minimum slant range at standard day meteorological conditions (59°F and 70% relative humidity). A description of the format and content of these reference datasets

is given in Appendix E. These reference data are used to compute the ALX, ALTX, PNLX, PNLTX, EPNLX, SELX, and/or SELTX profile data at the reference power setting for the profile output meteorological conditions. These reference power profile data are then used to interpolate and/or extrapolate the profile data to the requested power setting and airspeed. These final profile data are printed in tabular form on the OUTPUT file and/or written on file TAPE3 in the format required by the NOISEMAP program. Since only the SELTX, SELX, or EPNLX data are used by the NOISEMAP program, only these profile datasets can be written to file TAPE3. A description of the format and content of this TAPE3 file is given in Appendix F. A complete sample problem with a listing of all input and output data is given in Appendix C.

The OMEGA 11 program inputs all ground run-up noise reference datasets for the aircraft being analyzed from file TAPE7 which was also set up from NOISEFILE 4 with a CDC UPDATE run. These reference datasets contain spectral data at 10° angular increments for angles 0 to 180 degrees at a specific power setting and standard reference distance (250 feet) and for standard day meteorological conditions (59°F, 70% relative humidity, and 29.92 in. Hg.). The format and content of these reference datasets are described in Appendix G. These reference SPL spectra are then used to extrapolate spectral data for the same angles at 22 standard profile distances for any reasonable meteorological conditions, all at the reference power settings. These extrapolated spectral data are used to derive PNLX, PNLTX, ALX and ALTX data for each angle and profile distance. These PNLTX, ALX and ALTX data for two power settings are then used to interpolate the final ground run-up noise profile data required by the NOISEMAP program; they are written on file TAPE2 in the format described in Appendix H. A complete sample problem with a listing of all input and output are given in Appendix D.

The profile datasets written in the TAPE2 and TAPE3 files as described in the above programs are the primary aircraft noise data used by the NOISEMAP program to generate noise profiles around a specific airbase. With these programs these noise data can be

tailored to the specific weather and aircraft flight and ground run-up power conditions for that airbase which will, in turn, improve the accuracy of the final noise contours.

These OMEGA 10 and 11 programs will probably be modified and combined into one program (NOISECALL) which will be part of a larger NOISEMAP preprocessor program.

GENERAL OVERVIEW OF THE OMEGA 10 PROGRAM

The OMEGA 10 program, hereafter referred to as simply the "program", is designed to compute descriptions of the noise of an aircraft in terms of A-weighted overall sound level (ALX), tone-corrected A-weighted overall sound level (ALTX), perceived noise level (PNLX), tone-corrected perceived noise level (PNLT), effective perceived noise level (EPNLX), sound exposure level (SELX), and tone-corrected sound exposure level (SELTX) as a function of slant distance to the aircraft, aircraft power setting, and aircraft airspeed. These noise measure data (profile datasets) are computed for aircraft flyover tests as outlined in AMRL-TR-73-107.(1) The EPNLX, SELX and/or SELTX profile datasets are required as input to the NOISEMAP noise exposure forecast program and also are the flyover part of the NOISEFILE 3 database.

To compute the above integrated noise measures at the requested meteorological conditions and for each power setting (PSC) and airspeed requested on the code sheet, the program first reads in all reference file datasets for aircraft ACC. A description of these reference datasets is given in Appendix E. Each reference SPL spectrum is then extrapolated to each of the 22 standard slant distances and to the requested temperature and relative humidity from which PNLX, PNLTX, ALX and ALTX noise measures are determined. These four extrapolated noise measures as well as the mean PNLA, PNLTA, ALA, and ALTA data computed from the mean reference spectrum and the mean EPNLA, SELA, and SELTA data from the reference dataset are used to compute the PNLX, PNLTX, PLX and ALTX single event measures and the EPNLX, SELX and SELTX integrated measures at each distance, power setting, and airspeed. The final profile noise measures are then interpolated or extrapolated from these single event noise data using the Δ"6 rules.

The program prints plots and/or listings of almost all of the above input and computed data. The following is a summary of the program operations:

(1) The program reads the code sheet input data and all reference datasets for aircraft ACC and initializes numerous test variables.

(2) The program (subroutine SETUPD6) determines which reference file datasets are required to compute the requested profile data at each power setting.

(3) The cover page is printed when IPR>0.

(4) The PNLA, PNLTZ, ALA and/or ALTA data are computed from each reference spectrum used in the analysis.

(5) A tab plot of the reference spectrum is printed on page G (IPR>0).

(6) The PNLX through SELX (7 measures) single event noise measures are computed from the 22 extrapolated SPL spectra for air-to-ground and ground-to-ground propagation for the reference dataset power setting and program reference airspeed (250 knots). Computer listings of the SPL specta plus these seven single event measures at each distance and tab plots of these single event measures, all at the reference file power setting and airspeed, are printed only when IPR>0 for the NP=0 option.

(7) The Δ"6 rules are then applied to compute the final profile data for one (IPR=0) or all (IPR=1) single event measures at each power setting (PSC). Computer listings and plots of these profile data are printed only when IPR equal one.

(8) These EPNLX, SELX and/or SELTX profile data are written on file TAPE3 when IPU is greater than zero. A complete description of these profile datasets is given in Appendix F. Since the remaining PNLTX, PNLX, AL and ALTX single event measures are not used as input to the NOISEMAP program, they are not written on file TAPE3.

(9) The final summary page is always printed.

Examples of all the above tab plots and listings are presented with the sample problem in Appendix C. When IPR is less than one, only the summary page plus any error messages are printed on the OUTPUT file. For IPR greater than zero, all single event measures are always computed (all MEAS are set equal to one), while, for IPR equal to zero, only one requested measure (MEAS>0), is computed (default in SELX).

The CDC FORTRAN Extended (FORTRAN IV) computer language was used for the entire program. The common and subroutine features of the language were used extensively throughout the program to save computer time and core.

The following sections describe the detailed tasks accomplished by the program. It is intended to document the procedures within each subroutine at a level useful to either a programmer reading this while working with the code or a reader simply interested in what happens with a specific subroutine. The algorithms used to compute the noise measures are described in detail in the individual subroutines.

GENERAL ORGANIZATION OF THE OMEGA 10 PROGRAM

The general organization of the entire program is shown in Figure 1. The arrows indicate access to the various routines rather than program flow; for example, MAIN calls subroutine CDIST which in turn calls subroutines CPNL, CPTC and CAL and subroutine CPNL calls function FNOY. Function ICV is called numerous times from the MAIN routine and subroutines OUTG, OUTH, OUTJ, DELTA6, and SETUPD6. The circled numbers indicate the input (TAPE5) and output (TAPE3 and TAPB6) files.

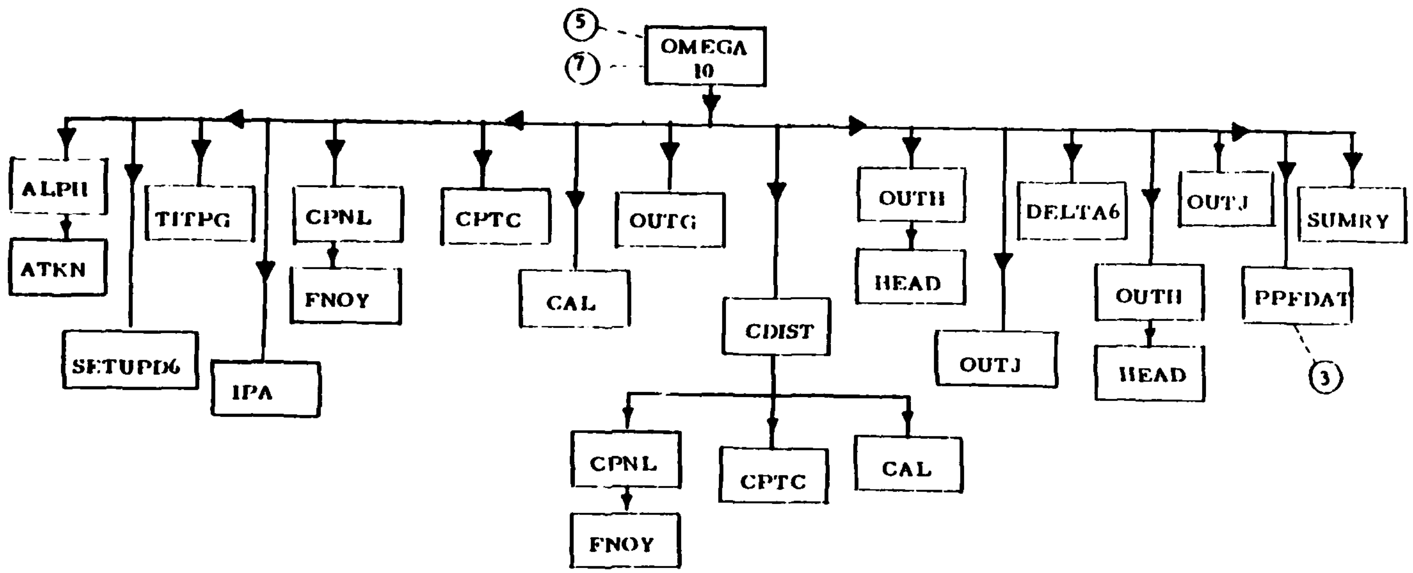
Using Figure 1 as a guide, this section summarizes in very general terms the functions performed by the entire program. This is meant to serve as an introduction for the reader to the functions of the individual subroutines.

The control routine, MAIN, reads the job control card, the aircraft code sheet card, and the operation power information card (or cards). For non-standard temperature and humidity, subroutine ALPH is called to compute the atmospheric absorption data. Numerous program and test variables are initialized at the beginning of the MAIN routine.

Next the program reads all reference datasets for aircraft ACC from the reference file (TAPE7). These datasets are checked for errors which will result in the aircraft data being deleted from the job. At the end of the dataset input, subroutine SETUPD6 is called to determine which datasets are required to compute the profile data at each requested output power setting (PSC).

Subroutines TITLE and IPA are called (for IPR>0) to print the cover page and initialize plot arrays used in subroutines OUTG and OUTJ.

Subroutines CPNL, CPTC and CAL are called to compute the PNLA, C and ALA data for each reference spectrum; the PNLTA and ALTA data are then computed in the MAIN routine. Subroutine CPNL uses function FNOY to compute the noy data for each SPL level. These data



NOTE: Function ICV is used in numerous routines throughout the program. Also data are written on file TAPE6 by many routines (TAPE6 is the OUTPUT file).

Figure 1. General Organization of the OMEGA 10 Program.

as well as a plot and listing of the reference SPL spectrum are printed on output page G by subroutine OUTG (IPR>0).

Subroutine CDIST is called for each reference power setting (reference dataset) and each type propagation (air-to-ground and ground-to-ground) to extrapolate the SPL reference spectrum to 22 standard profile distances at a selected temperature and humidity, compute PNLX, PNLTX, ALX, ALTX and C for each extrapolated spectrum, compute the SELX, SELTX and EPNLX measures for each distance at the reference file airspeed, and finally compute the smoothed EPNLX, SELTX, PNLTX and ALTX data. These final EPNLX, SELX and SELTX profile data are adjusted to the program reference airspeed (250 knots). Then all seven profile measures are stored in arrays PRDA (air-to-ground) and PRDG (ground-to-ground). This subroutine calls subroutines CPNL, CPTC, and CAL to compute the above PNLX, C and ALX data. Subroutine CPNL also uses function FNOY to compute the noy data required by the PNLX algorithm.

When the program is in the print mode (IPR>0) with the NP=0 option in effect, listings of the extrapolated SPL spectra and the single event data (PNL etc.) for each distance are printed by subroutine OUTH. The SPL spectra are printed on output pages H and L for air-to-ground and ground-to-ground, respectively; the single event data are, likewise, printed on pages I and M. Subroutine OUTH calls subroutine HEAD to print each page header block. Also tab plots of these same single event data are printed by subroutine OUTJ. The air-to-ground PNLTX, PNLX, ALX and ALTX single event data are plotted on output page J and the SELTX, SELX and EPNLX, single event data on page K. The corresponding ground-to-ground single event data are plotted on pages N and O. All these data are computed at the reference power setting and airspeed.

When the program is in the print mode but with NP>0, the final profile data for the seven single event measures for each requested power setting (PSC) and airspeed (VX) are computed by subroutine DELTA6. These data are computed by applying the Δ"6 rules to extrapolate or interpolate these data from the reference

data. Once again, listings and plots of these single event measures are printed by subroutines OUTH and OUTJ, respectively.

In the no print mode (IPR=0) for all NP, the program only computes the <u>one</u> single event measure requested by the MEAS code sheet parameter plus all other data required to compute this requested measure. No plots or listings are printed and subroutines OUTH and OUTJ are not called.

Next, when the program is in the punch mode (IPU 0), subroutine PPFDAT is called to write either one measure (IPR=0) or all three EPNLX, SELX and SELTX single event measures (IPR>0) on file TAPE3 in the standard profile dataset format (Appendix F). Finally, the summary page is printed and program control is returned to label 10 to begin the next aircraft analysis or terminate the job. Note that the PNLTX, PNLX, ALX, and ALTX single event measures can not be written to file TAPE3.

DEFINITIONS OF SYMBOLS AND TERMINOLOGY USED IN THE OMEGA 10 PROGRAM

The symbols defined here are used in this report and/or in the OMEGA 10 program source listing. They are a subset of the complete symbol versus reference list given in the SUPER INDEX in Appendix I. Many of the symbols given in the SUPER INDEX are really dummy variables used in only one or two routines and redefined in each routine; most of these symbols are not included in this list of symbol definitions. Symbols which are arrays will be listed with their array dimensions. Variables I, J, and L are usually (but not always) used as array subscripts as follows:

(1) The subscript "I" is a running index associated with any one spectrum or standard profile distance.

(2) The subscript "J" is a running index associated with any one band in the set of 1/3 octave frequency bands.

(3) The subscript "L" is a running index associated with any one power setting.

SYMBOL	DESCRIPTION
AC	Aircraft name (10 characters or less).
ACC	Aircraft code (3 characters -- see code sheet).
ALA(6)	Mean reference A-weighted overall sound level in dBA.
ALTA(6)	Mean reference tone-corrected A-weighted overall sound level in dBA.
ALTX(22)	Profile tone-corrected A-weighted overall sound level for each distance for the reference power setting and airspeed in dBA.
ALX(22)	Profile A-weighted overall sound level for each distance for the reference file power setting and airspeed in dBA.
ATNC(24)	Atmospheric absorption coefficients for the OMEGA 10 profile output (ITEMP and IRHUM) in dB per 1000 feet.
ATNR(24)	Atmospheric absorption coefficients for standard day conditions (59°F and 70%) in dB per 1000 feet.
AW(24)	A-weighting coefficients in dB.
BLK	A data statement variable carried in OUTC labeled common containing a blank Hollerith character. It is used to print variable format data and initialize numerous program variables.
COMD(6)	Last five characters of each reference file dataset COMDECK name.
CRI	Comdeck revision identifier (see code sheet).
D2X(22)	Factor to adjust the measure data to the correct profile slant distance.
DATE	Date of computer run (see code sheet).
DATEN	Date of computer run in numeric form which is used as part of the data identification code on tab plots and in the reference dataset (see code sheet).
DELN	Noise adjustment factor added to each band in the reference spectrum (dB).
DG	Ground-to-ground propagation adjustment factor.
DRAG(3,6)	Drag configuration read from the reference dataset and printed on output page G.

SYMBOL	DESCRIPTION
EA(13,13)	Excess atmospheric attenuation in dB for bands 17 to 29 and distances 400 to 6300 feet.
EPNLA(6)	Mean reference effective perceived noise level for each power condition in EPNdB.
EPNLX(22)	Profile effective perceived noise level in EPNdB for each distance for the reference power setting and airspeed.
ET(2)	Engine type read from the reference dataset and printed on page G and on the second profile dataset comment card.
EXTMX	Maximum permitted Δ"6 extrapolation from the reference value at a slant distance of 1000 feet for the first air-to-ground measure (EXTMX=5.0 dB).
FJ	Constant used in the perceived noise level computations; FJ=0.15 for 1/3 octave band data.
FL(24,5)	Data statement array used in noy computations (function FNOY) containing the band sound pressure levels in dB given in Table 3.
FM(24,4)	Data statement array used in noy computations (function FNOY) containing the reciprocals of the slopes given in Table 3.
FREQ3(24)	Geometric mean and lower limiting frequencies required to compute atmospheric absorption coefficients for 1/3 octave data.
H0	Reference minimum slant range for the power setting being computed.
IAP	Index of the reference approach operation power code and corresponding power setting data.
IBNH	Largest band number index (24 corresponds to band 40).
IBNL	Initial band number index (1 corresponds to band 17).
ID	Variable frequently used to identify the SPL data to be used in the specific computations.
IHP	Index of the highest ranking reference file power setting less than approach power.
IMS(6)	Reference minimum slant range in feet for each power setting.

SYMBOL	DESCRIPTION
IORD(28)	Tab plot ordinate scale values.
IPAGE	Part of page number identification.
IPR	Program print control flag (see code sheet).
IPROP	Propagation type code; 1 for air-to-ground and 2 for ground-to-ground.
IPTC	Index of band which determines the tone correction for the reference distance profile spectrum.
IPU	Program profile dataset print (file TAPE3) control flag (see code sheet).
IRD	Profile distance index which corresponds to the reference minimum slant range.
IREF(12)	Flag used to indicate change in slope reference indices because the reference and requested power settings are on different sides of approach power (see subroutine DELTA6).
IREQ(6)	Program flag used to indicate which reference data are required to compute the requested profile output.
IREQC(3,12)	Indices of reference power setting and two slope power settings required to compute the profile output for each requested power setting. See subroutine DELTA6 for the complete definition.
IRHUM	Reference relative humidity in percent.
ISEQD(7)	Data statement array in subroutine OUTH containing the indexes of the measure data in array SENX in the sequence required for printing.
ISEQF(7)	Same as ISEQD except ISEQF contains the index of the variable format array corresponding to each measure data point.
ISRC(24)	Integer value of mean reference data.
ITEMP	Reference surface temperature (F).
ITP	Index of the reference takeoff operation power code and corresponding power setting data.
[illegible]6)	Reference aircraft velocity in knots for each power setting.
IVER	Program version code.

SYMBOL	DESCRIPTION
IVX	Integer value of the reference or profile aircraft velocity in knots.
LFLG(12)	Program flag used to flag profile data when the extrapolation limit is exceeded or when data are omitted because of Δ"6 problems.
LIM	Extrapolation check flag. Extrapolation is checked only when LIM=1.
MEAS(3)	Program control variable used to select the profile measure for the no-print mode (see code sheet).
MM	Maximum number of reference power settings per aircraft (MM=6).
MOPC	Maximum number of operation power codes defined in array OPP in subroutine SETUPD6.
N	Number of reference file power settings read from file TAPE7 for aircraft ACC.
NP	Number of output power settings for which profile data are requested for this aircraft.
NPM	Maximum NP permitted by the program (NPM=12).
NR(6)	Number of runs (measure locations) averaged to obtain the given reference data for each power setting (the reference data were computed in the OMEGA 6 program).
OPC(6)	Operation power code for each reference power setting.
OPCC(12)	Operation power code for each profile output power setting.
OPCD(12)	Data statement array containing the default profile output operation power codes.
OPCR(12)	Operation power code for the reference data from which the OPCC data are computed and the operation description taken.
OPP(20)	Data statement array containing all (MOPC) defined operation power codes for flight data. This array must be updated when new codes are defined (see subroutine SETUPD6).

SYMBOL	DESCRIPTION
OTC	Operation type code.
P(2,6)	Power setting description data for each reference power setting.
PC(2,12)	Power setting description data for each profile output power setting.
PNLA(6)	Mean reference perceived noise level in PNdB for each power setting.
PNLTA(6)	Mean reference tone-corrected perceived noise level in PNdB for each power setting.
PNLTX(22)	Profile tone-corrected perceived noise level for the reference power setting and airspeed in PNdB.
PNLX(22)	Profile perceived noise level for the reference power setting and airspeed in PNdB.
PRDA(22,6,7)	Profile data for EPNLX, SELTX, and SELX for air-to-ground propagation for each reference power setting and adjusted to the program reference airspeed (RV).
PRDC(22,7,2)	Final EPNLX, SELTX, and SELX profile data for air-to-ground and ground-to-ground for one power setting (computed by subroutine DELTA6).
PRDC(22)	Array used in subroutine DELTA6 to compute the profile data for one specific measure and type propagation.
PRDG(22,6,7)	Same as PRDA above except for ground-to-ground data.
PRDI(22,6)	Array equivalent (subroutine DELTA6 argument) to specific elements of array PRDA or PRDG. Contains all available profile reference data for one measure and one type propagation.
PS(2,6)	Reference power setting data (value and units in character format) for each reference operation power code.
PSC(12)	Profile output power setting for each requested operation power code in character format (see code sheet).
PSCF(12)	Same as PSC(12) except in numeric format.
PSIF(6)	Reference power setting in numeric format.

SYMBOL	DESCRIPTION
PSU	Power setting units for this aircraft.
PTC	Tone correction in dB.
PV	Profile version code (see code sheet).
RV	Program reference airspeed in knots (RV=250).
SELA(6)	Mean reference sound exposure level in dB for each power setting.
SELTA(6)	Mean reference tone-corrected sound exposure level in dB for each power setting.
SELTX(22)	Profile tone-corrected sound exposure level in dB for a specific reference power setting and airspeed.
SELX(22)	Profile sound exposure level in dB for a specific reference power setting and airspeed.
SENX(22,7)	Array equivalent to arrays PNLTX(22) through SELX(22) in blank common.
SOURCE(2,6)	Identifies the program and date from each reference dataset.
SPLA(6,24)	Mean reference sound pressure level in dB for each power condition.
SPLX(22,24)	Profile sound pressure level in dB.
SR(6,33)	Mean reference data for each power condition; equivalent to arrays SPLA through CA in blank common (see subroutine CDIST).
SX(22)	Distance data in feet for the 22 profile distances.
TAPE3	File on which profile datasets are written; TAPE3 may be copied or equivalenced to the PUNCH file.
TAPE5	Input file for all OMEGA 6 data; TAPE5 is equivalenced to the system INPUT file.
TAPE6	Output file on which all tab output are printed; TAPE6 is equivalenced to the system OUTPUT file.
TAPE7	Input file for all reference datasets.
THETA(6)	Mean reference angle of maximum radiation in degrees for each power condition (directivity angle).

SYMBOL	DESCRIPTION
VFCT	Variable used to adjust aircraft airspeed from reference dataset airspeed to program reference airspeed or from program reference to final profile airspeed.
VREF	Floating point value of the aircraft reference airspeed (IV).
VX(12)	Aircraft airspeed in knots for each profile power condition.

DETAILED DESCRIPTION OF THE OMEGA 10 PROGRAM

This section discusses the MAIN routine and each subroutine in the OMEGA 10 program. Procedures within most routines are documented at a level useful to a programmer reading this while working with the code or a reader interested in what happens within a specific subroutine. Most routines contain numerous comments which should be very helpful in following the code.

The program algorithms and I/O are discussed in the routines in which they are coded. The program code sheet in Appendix A and the sample problem in Appendix C are referenced to simplify the description of the input and output. The more complex subroutines are supplemented by flow charts drawn from the point of view of function performed rather than block instructions.

COMMON VARIABLES

Extensive use is made of common in the program for communications between the various routines. Many of the storage locations in blank common are used in different ways or with different variable names throughout the program to save core. Several of the large arrays are included in blank common rather than labeled common because on the CDC CYBER computers a large blank common reduces the total core required to load and execute the program. The variables used in labeled common are usually of a similar type and/or used in many of the same subroutines.

The variables assigned to blank and labeled common in the MAIN routine and the total common length are listed in Table 1. The subroutines in which the labeled common are used are listed in Table 2. All blank and labeled common are included in the MAIN routine. All common variables are defined in the complete list of symbols in the previous section of this report. The blank and labeled common are described in the following paragraphs.

TABLE 1

MAIN ROUTINE VARIABLES IN BLANK AND LABELED COMMON

	Blank Common	Labeled Common HEADC	COMPC	OUTC
	IBNL	AC	IV(6)	ORD(43)
	IBNH	DATE	IMS(6)	ISC(9)
	L	ACC	P(2,6)	IORD(28)
	SR(6,33)	IPAGE	OPC(6)	DASH
	NR(6)	IVX	OPCC(6)	DOT
	ISRC(24)	ITEMP	PS(2,6)	X
	SPLX(22,24)	IRHUM	PSC(12)	BLK
	PNLTX(22)	IVER	PSU	DATEN
	PNLX(22)	CRI	PSIF(6)	PP(84,3)
	ALTX(22)	ET(2)	PSCF(12)	
	ALX(22)	OTC	IREQC(3,12)	
	EPNLX(22)		SX(22)	
	SELTX(22)		ATNC(24)	
	SELX(22)		ATNR(24)	
	PRDA(22,6,7)		DELN	
	PRDG(22,6,7)		IPTC	
	PRDC(22,7,2)		IPROP	
			MEAS(3)	
			OPCR(12)	
			PC(2,12)	
Length	1837	13	245	337

TABLE 2

SUBROUTINES CONTAINING THE LABELED COMMON

HEADC	COMPC	OUTC
HEAD	CDIST	IPA
OUTG	HEAD	OUTG
OUTJ	OUTG	OUTH
PPFDAT	OUTJ	OUTJ
SUMRY	PPFDAT	
TITPG	SETUPD6	
	SUMRY	

Blank Common

The 3069 storage locations used by blank common in the main routine is the maximum required in any routine in the program. Almost all routines use some blank common but only a few require the 3069 locations. The variable names assigned to blank common vary throughout the program. Most variables are defined to communicate with several subroutines and then redefined for the next series of routines.

COMPC Common

These variables are a combination of output variables and variables required to compute the profile data or both. The variable names are the same throughout the program.

HEADC Common

These variables are primarily output variables required to identify the data being analyzed. Most of these data are printed in the page header blocks, the plot identification blocks, and the output COMDECK comment cards. The variable names are the same throughout the program.

OUTC Common

These variables are required to set up and print the tab listings and plots in subroutines OUTG, OUTJ and OUTH. If all tab output are deleted (eg. in some future preprocessor version of this program), this common statement will no longer be required. These storage locations are defined the same throughout the program; howeever, several variable names or array dimensions are changed in subroutines OUTG and IPA.

MAIN PROGRAM

MAIN is the executive routine for the entire OMEGA 10 program. Its principal function is to call the subroutines required to compute the aircraft analysis. However, it also reads all the aircraft code sheet data, initializes numerous program and aircraft variables, and reads and checks the reference file (TAPE7) input data. The

MAIN routine is discussed in the following paragraphs using the program listing in Appendix I and the flowchart in Figure 2 as a guide.

<u>Method</u>

The first segment of the MAIN routine, from the beginning to label 150, performs the following data input and initialization steps:

(1) Numerous program and aircraft variables are initialized. The SX array contains the 22 standard profile distances:

$$SX_I = \text{antilog}\ \left(\frac{I+22}{10}\right) \qquad \text{feet}$$

where I is the standard distance index (I=1 to 22).

(2) The job control card is read and default values are set when they apply. For IPR equal to zero or blank (no-print mode), the IPU flag is always set equal to one and, if all MEAS are blank, $MEAS_3$ is set equal to one (SELX). For IPR equal one (print mode), all MEAS flags are set equal to one (all three measures are always computed).

(3) The code sheet cards for aircraft ACC are read and additional aircraft default parameters are set.

(4) The atmospheric absorption coefficients are computed for non-standard temperature and relative humidity. The coefficients for standard conditions (59°F and 70%) are stored in the ATNR data statement array.

(5) The TAPE7 reference file is rewound and searched for all reference datasets for aircraft ACC. All data for aircraft ACC must be back-to-back in the reference file. A maximum of six (MM) are read and stored in the program. If several datasets with the same operation power code (OPC) are in TAPE7, the last dataset for this OPC is stored in the program. These reference datasets are checked for errors in aircraft code, operation power code, and card sequence number; an error will abort this aircraft analysis (not the entire job).

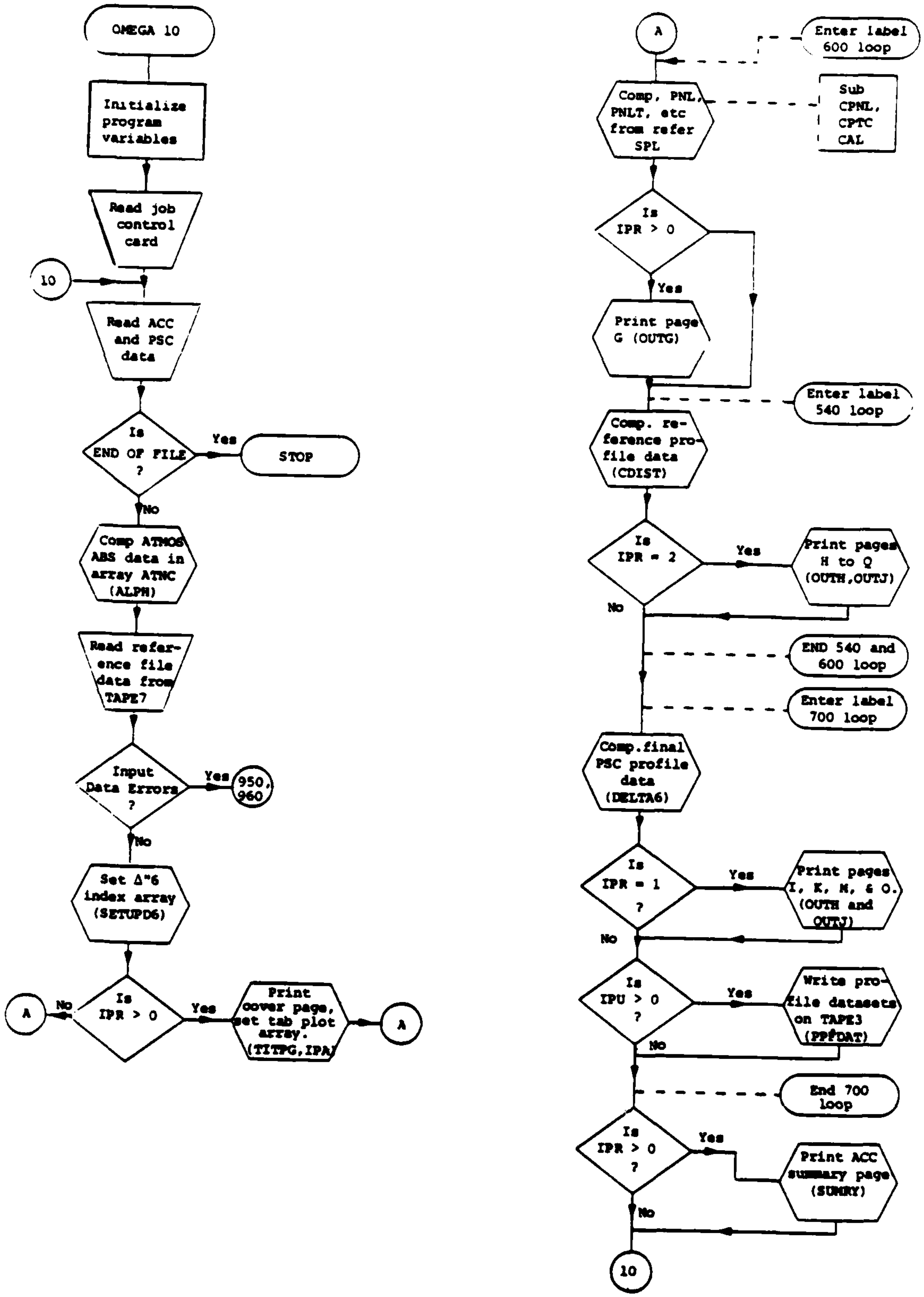


Figure 2. Flowchart for OMEGA 10 MAIN Routine.

After all input data are read and checked, the program calls subroutine SETUPD6 to apply the Δ"6 rules in the selection of the one, two, or three reference datasets required to compute the profile output dataset for each power setting (PSC). The indices of these reference data for each PSC are stored in array IREQC. Also flag array IREQ is set equal to one when the corresponding reference dataset is required to compute profile data. The IREQC and IREQ arrays are defined in greater detail in comment statements in subrotuines SETUPD6 and DELTA6.

For IPR greater than zero, the cover page is printed by subroutine TITPG and several plot arrays used to print the plots in subroutines OUTG and OUTJ are initialized by subroutine IPA.

The label 600 loop performs the following operations for each of the N reference dataset power settings (IREQ>0) required to compute the requested profile noise data at the PSC power settings:

(1) Subroutines CPNL, CPTC and CAL are called to compute the perceived noise level (PNLA), tone correction (C or PTC), and A-weighted overall sound level (ALA) from the reference SPL spectrum for the Lth power setting. The PNLA data are stored in $SR_{L,28}$ and the ALA are in $SR_{L,26}$. The tone-corrected perceived noise level (PNLTA) is:

$$SR_{L,29} = SR_{L,28} + PTC \qquad \text{PNdB}$$

and the tone-corrected A-weighted overall sound level (ALTA) is:

$$SR_{L,27} = SR_{L,26} + PTC \; . \qquad \text{dBA}$$

(2) Subroutine OUTG prints (for IPR>0) a tab plot and listing of the SPL reference spectrum and prints the data computed in step 1 above, the EPNLA, SELA, SELTA and THETA from the reference dataset, and numerous additional identification parameters, all for the Lth reference power setting.

(3) The 540 loop calls subroutine CDIST to compute all SPL and single event data for air-to-ground and ground-to-ground propagation. Subroutine CDIST extrapolates the reference SPL spectrum to each

profile distance and then computes all single event data for each distance. Subroutine OUTH prints tab listings of these SPL and single event data and subroutine OUTJ prints tab plots of the single event measure versus distance data (both only for the IPR>0 for the NP=0 option). The data printed here are at the reference power setting and airspeed (L^{th} power setting).

The label 700 loop performs the following operations for each of the NP output power settings (PSC):

(1) Subroutine DELTA6 is called to compute the final profile data for all single event measures when IPR>0 and for each requested (MEAS>0) measure when IPR=0. The indices of the reference profile data required to interpoalte or extrapolate (apply Δ"6 rules) these profile data are given in array IREQC which was evaluated in subroutine SETUPD6. These final profile data are stored in array PRDC. After all profile data are computed for the L^{th} power setting (end of loop 620), the LFLG program flag is checked. If LFLG is less than zero, no profile data were computed for this L^{th} power setting and the program skips down to the end of the 700 loop.

(2) For IPRR equal to one, subroutines OUTH and OUTJ are called to print and plot these final EPNLX through ALTX profile data. Note that whenever profile data are printed all seven measures are always computed.

(3) For IPU greater than zero, the requested (MEAS>0) EPNLX, SELTX and SELX profile measures are written on file TAPE3 by subroutine PPFDAT. In the print node (IPR>0), these data are usually not written on TAPE3. A description of the format and content of these flight noise profile datasets is presented in Appendix F.

After completing the label 700 loop operations, subroutine SUMRY is called to print the final aircraft summary page which lists numerous test identification parameters, identifies all reference datasets read for this aircraft, and lists the COMDECK names of all reference datasets required to interpoalte or extrapolate each profile dataset. Program control then returned to statement label 10 to perform the next aircraft analysis or to terminate the job.

SUBROUTINE ALPH(REL,TEMP,ABC,IL,IH)

This subroutine is called from the MAIN routine to compute the atmospheric absorption coefficients for non-standard output temperature (TEMP) and relative humidity (REL). The coefficients for standard day conditions (59°F, 70 percent) are stored in the MAIN routine.

Subroutine Arguments

The subroutine arguments are defined as follows:

(1) REL and TEMP are the relative humidity and temperature (°F) for which the ABC data are computed.

(2) ABC is the absorption coefficient array defined in this subroutine.

(3) IL and IH are the lowest and highest frequency indices for which the ABC are computed. They are 1 and 24, respectively, which corresponds to bands 17 and 40.

Data Statement Arrays

Array FREQ3 contains the geometric mean and lower limiting frequencies for 1/3 octave data. X and Y contain the normalized absolute humidity ($h_{normalized}$) and normalized molecular absorption coefficient ($\alpha_{normalized}$) data given in SAE ARP 866A.[2]

Atmospheric Absorption Coefficient Algorithm

The atmospheric absorption coefficients for 1/3 octave frequencies are computed as described below.

(1) The absolute humidity statement function is:

$$F(TEMP,REL) = \{(a)(REL)\}\{\text{antilog}[(b)(TEMP)+(c)(TEMP^2) + (d)(TEMP^3)]\}$$

where

$$a = 1.064764 \times 10^{-2}$$

$$b = 2.288074 \times 10^{-2}$$

$$c = -9.589 \times 10^{-5}$$

$$d = 3.0 \times 10^{-7}$$

(2) The normalized absolute humidity ($h_{normalized}$) is computed as a function of frequency.

$$HN = \frac{F(TEMP,REL)}{\left(\frac{FREQ}{1010}\right)^{1/2}}$$

where

FREQ = the geometric mean or lower limiting frequency for the 1/3 octave frequency.

(3) A quadratic Aitkin interpolation fucntion is used to compute the normalized molecular absorption coefficient (ALN) for a given normalized absolute humidity (HN).

(4) Then the atmospheric absorption coefficient (ABC) as a function of frequency is:

$$ABC = (FREQ)(FT1)(ALN)+(FT2)(FREQ)^{2.05} \qquad dB$$

where

$$FT1 = (3.788785 \times 10^{-3})(\text{antilog}[4.6833333 \times 10^{-3} \times TEMP])$$

$$FT2 = (2.4931591 \times 10^{-8})(\text{antilog}[6.33 \times 10^{-4} \times TEMP])$$

(FREQ)(FT1) = maximum molecular absorption coefficient.

$(FT2)(FREQ)^{2.05}$ = classical absorption coefficient.

FUNCTION ATKN(X,Y,N,K,XI)

This function is a general AITKEN interpolation function, used by subroutine ALPH to compute the normalized molecular absorption coefficient. ATKN was obtained from the ASD computer center library (old IBM 7094 library). Since this is a common interpolation function defined in most numerical methods texts, no additional description will be given. The function arguments are defined in comment statements in the listing.

FUNCTION ICV(DR)

This function is used in numerous routines to convert variable DR from floating point to integer. The resulting integer is rounded up when the fractional part is greater than or equal to 0.5. This method gives more consistent and conservative noise measure data than would be obtained by simple truncation.

SUBROUTINE HEAD(IP)

This subroutine is called from subroutine OUTH to print the header block on output pages H, I, L and M. The IP subroutine argument identifies the page for which the header block is requested. These header blocks are 108 columns wide (printer columns 11 to 119). Each header block contains the five categories of data information described below:

(1) The identification block located in the upper right corner identifies the specific OMEGA program that produced the page, the aircraft code, the operation type and power codes (OPS), the profile version code, the date of that computer run, and the page number of that particular computer printout. These identification data enable AMRL to locate and track specific results in our data bank and reconstruct the source of the data and all processing parameters and computations.

(2) The table title printed across the top describe the measures or type of data presented on that page.

(3) The aircraft block identifies the specific aircraft (eg., C-141).

(4) The operation block presents the operation power description, the power setting, and the airspeed.

(5) The meteorology block gives the temperature (°F), relative humidity (percent), and Delta N (dB). Note that Delta N is not a meteorology related constant.

SUBROUTINE IPA

This subroutine is called from the MAIN routine to initialize the ORD, PD, PB, and PM arrays used to print the tab plots in subroutines OUTG and OUTJ. The content of these arrays is obvious in the coding.

SUBROUTINE OUTG

This subroutine is called from the MAIN routine to print the tab plot and listing of the reference SPL spectrum versus 1/3-octave frequency for the L^{th} power setting. The PNLA, PNLTA, AL, ALTA, and C data computed from this mean spectrum and THETA, EPNLA, SELA and SELTA from the reference dataset as well as various operation and identification parameters are also printed below the tab plot.

Method

The integer SPL data are computed and stored in array ISRC. The maximum annotated abscissa scale value (MX) is the nearest multiple of ten less than seven plus the maximum SPL. The minimum scale value (MN) is 70 dB less than MX. The abscissa scale is defined in array ISC. The actual plotted maximum and minimum are two greater than MX and two less than MN.

The SPL data are scaled, set up in the print array (PP), and printed in the label 150 loop. The remainder of the subroutine completes the tab plot and prints the PNLA, PNLTA, etc. data below the tab plot. The detailed format of these page G data can best be observed by consulting the sample problem in Appendix C. There should

be sufficient comment statements in the subroutine listing to identify the data being printed.

SUBROUTINE CDIST(IRD,RV)

This subroutine is called from the MAIN routine to compute the single event noise profile data (e.g., SELX versus distance for 22 distances from 200 to 25,000 feet) for air-to-ground (IPROP=1) or ground-to-ground (IPROP=2) propagation for the L^{th} reference power setting. These data are also adjusted to the output temperature and relative humidity and to the program reference (RV) airspeed.

The subroutine argument IRD is the index of the standard distance which is within 1 percent of the reference distance. IRD is determined in this subroutine and returned to the MAIN routine.

The EA data statement array contains the excess attenuation data for frequencies 50 Hz to 800 Hz and distances 400 to 6300 feet. These data were obtained from Figure 3 which was taken from AMRL-TR-75-50.[3] They are required to compute the ground-to-ground propagation data.

The flowchart in Figure 4 provides a brief description of the data computed by this subroutine.

Extrapolated SPL Spectra

The first segment of this subroutine (label 30 loop) extrapolates the reference SPL spectrum to each of the 22 profile distances defined in array SX. These 22 SPL spectra are used to compute the single event profile data for air-to-ground propagation. The extrapolation algorithm is:

$$SPLX_{I,J} = SPLA_{L,J} - \frac{(SX_I)(ATNC_J) - (H0)(ATNR_J)}{SNTH} - 20 \log (SX_I/H0) + DELN \qquad \text{dB}$$

where

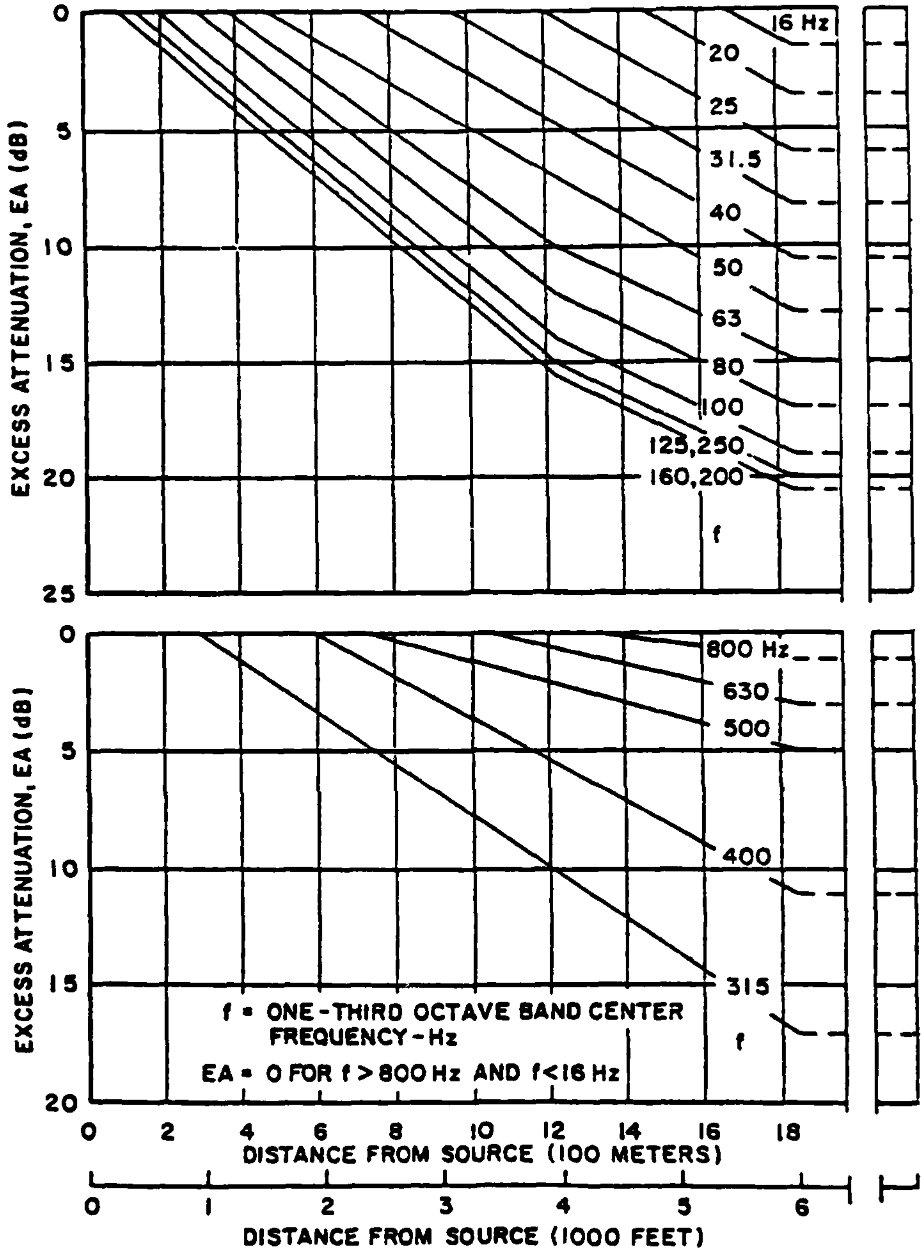


Figure 3. Excess Attenuation.(3)

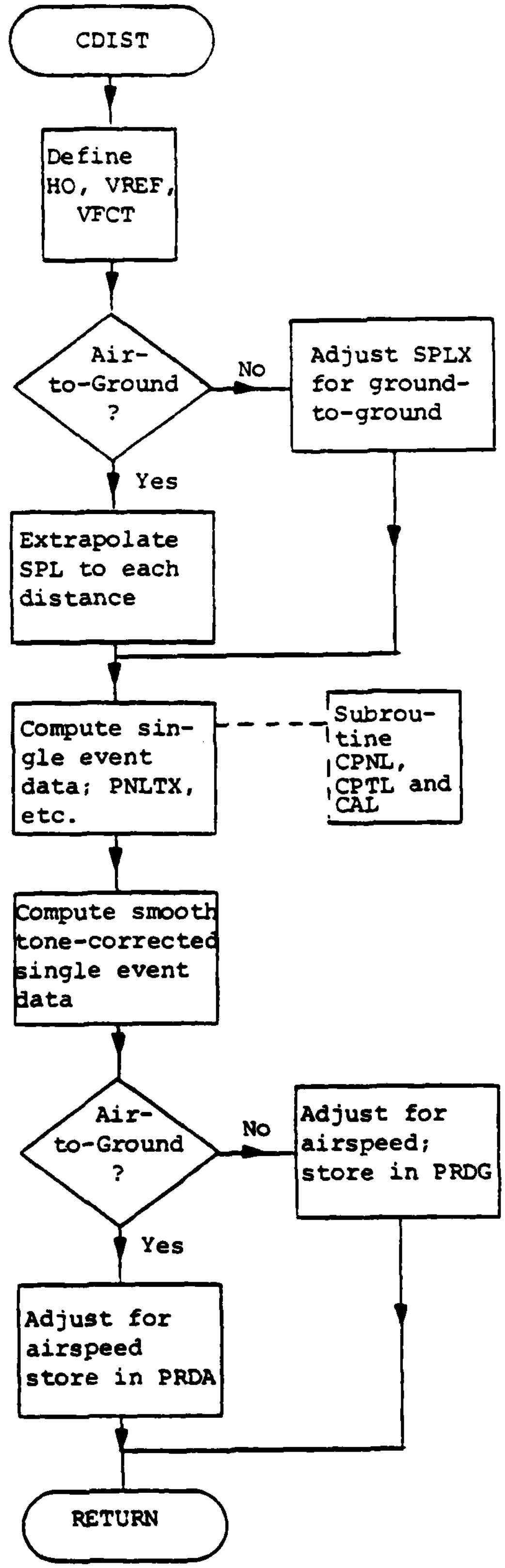


Figure 4. Flowchart for Subroutine CDIST.

$SPLX_{I,J}$ = the sound pressure level in dB for the I^{th} distance and J^{th} band.

$SPLA_{L,J}$ = the mean sound pressure level in dB for the L^{th} reference power setting and the J^{th} band.

SX_I = antilog $(\frac{I+22}{10})$ which is the I^{th} profile distance in feet.

$ATNC_J$ = the atmospheric absorption coefficients in dB per 1000 feet for the profile output temperature (ITEMP) and humidity (IRHUM).

$ATNR_J$ = the atmospheric absorption coefficients in dB per 1000 feet for standard day conditions.

SNTH = (1000) (SIN [$THETA_L$]).

$THETA_L$ = the directivity angle in degrees for the L^{th} power setting.

H0 = the reference minimum slant range in feet for the L^{th} power setting.

DELN = the constant dB level added to all SPL bands for the L power setting.

The following distance function used later in this subroutine to adjust the integrated single event data for changes in slant range is also computed in this segment of the program:

$$D2X_I = 6 \log (SX_I/H0) .$$

Adjust the SPL Spectra for Ground-to-Ground Propagation

The SPL spectra computed for air-to-ground propagation are adjusted for ground-to-ground propagation after all air-to-ground data are computed for the L^{th} reference power setting:

$$SPLX_{I,J} = SPLX_{I,J} - EA_{I-3,J}$$

where

I = the distance index defined for the 4^{th} through 16^{th} distance.

J = the frequency band index defined for frequency bands 17 through 29.

$EA_{I-3,J}$ = excess attenuations in dB for the I^{th} distance and J^{th} frequency.

$$SPLX_{I,J} = SPLX_{I,J} - EA_{13,J}$$

where I is defined for distances 17 through 22 and J is defined for bands 17 through 29. The excess attenuation is constant for distances greater than 6300 feet.

A constant ground-to-ground adjustment factor of 5 dB (DG) is also subtracted from the air-to-ground SPL for all distances and all frequency bands:

$$SPLX_{I,J} = SPLX_{I,J} - DG$$

Single Event Noise Data

The statement label 150 loop computes all single event noise data for each of the profile distances. Subroutines CPNL, CPTC, and CAL are called to compute the perceived noise level (PNLX), tone correction (PTC) and the A-weighted overall sound level (ALX), respectively, for each distance spectrum. If PNLX data are missing for distances beyond the second distance, the PNLX data are extrapolated as follows:

$$PNLX_I = (2)(PNLX_{I-1}) - PNLX_{I-2} \qquad \text{PNdB}$$

The tone-corrected perceived noise level (PNLTX) and tone-corrected A-weight overal' sound level (ALTX) for the I^{th} distance are:

$$PNLTX_I = PNLX_I + PTC \qquad \text{PNdB}$$

$$ALTX_I = ALX_I + PTC \qquad \text{dBA}$$

The effective perceived noise level (EPNLX), sound exposure level (SELX), and tone-corrected sound exposure level (SELTX) are:

$$EPNLX_I = EPNLA_L + PNLTX_I - PNLTA_L + D2X_I \qquad \text{EPNdB}$$

$$SELX_I = SELA_L + ALX_I - ALA_L + D2X_I \qquad \text{dB}$$

$$SELTX_I = SELTA_L + ALTX_I - ALTA_L + D2X_I \qquad \text{dB}$$

where $EPNLA_L$, $SELA_L$, and $SELTA_L$ are the mean data from the reference dataset for the L^{th} power setting. The $PNLTA_L$, ALA_L, and $ALTA_L$ were computed from the reference SPL spectrum for the L^{th} power setting.

Smooth Tone-Corrected Data

The last segment of this subroutine (statement label 220 loop) computes the smoothed ALTX, PNLTX, SELTX, and EPNLX data for each distance (I) and adjusts these data to the program reference airspeed:

$$ALTX_I = ALX_I + (C2)(D3) \qquad \text{dBA}$$

$$PNLTX_I = PNLX_I + (C2)(D3) \qquad \text{PNdB}$$

$$SELTX_I = SELX_I + (C1)(D3) \qquad \text{dB}$$

$$EPNLX_I = EPNLX_I + (C1)(D3) - C3_I \qquad \text{EPNdB}$$

where

$C1 = SELTX_{IRD} - SELX_{IRD}$ dB

$C2 = ALTX_{IRD} - ALX_{IRD}$ dBA

IRD = the index of the reference distance

$C3_I = SELTX_I - SELX_I$ dB

D3 = 1.0 for distances 200 to 3,150 feet

D3 = (0.2) (18-I) for distances 4,000 to 8,000 feet (I=14 to 17).

D3 = 0.0 for distances 10,000 to 25,000 feet.

The $SELTX_I$ used to compute $C3_I$ above is the unsmoothed $SELTX_I$ defined in the previous section; that is, $C3_I$ is the tone correction for the unsmoothed SELTX and EPNLX data.

All EPNLX, SELTX, and SELX data for the L^{th} reference power setting are adjusted to the program reference airspeed and stored in arrays PRDA or PRDG as required in subroutine DELTA6. The four remaining single event measures, PNLTX through ALX, are also stored in arrays PRDA and PRDG, but without the airspeed adjustment which does not apply to these nonintegrated measures. It should also be noted here that all seven measures are stored in blank common arrays PNLTX through SELX without the airspeed adjustment.

For air-to-ground propagation (IPROP=1):

$PRDA_{I,L,1}$	$= EPNLX_I - VFCT$	EPNdB
$PRDA_{I,L,2}$	$= SELTX_I - VFCT$	dB
$PRDA_{I,L,3}$	$= SELX_I - VFCT$	dB
$PRDA_{I,L,4}$	$= PNLTX_I$	PNdB
$PRDA_{I,L,5}$	$= PNLX_I$	PNdB
$PRDA_{I,L,6}$	$= ALTX_I$	dBA
$PRDA_{I,L,7}$	$= ALX_I$	dBA

and for ground-to-ground propagation (IPROP=2):

$PRDG_{I,L,1}$	$= EPNLX_I - VFCT$	EPNdB
$PRDG_{I,L,2}$	$= SELTX_I - VFCT$	dB
$PRDG_{I,L,3}$	$= SELX_I - VFCT$	dB
$PRDG_{I,L,4}$	$= PNLTX_I$	PNdB
$PRDG_{I,L,5}$	$= PNLX_I$	PNdB
$PRDG_{I,L,6}$	$= ALTX_I$	dBA
$PRDG_{I,L,7}$	$= ALX_I$	dBA

where VFCT adjusts the airspeed from the reference file airspeed for the L^{th} power setting (IV_L) to the program reference airspeed (RV) in knots:

$$VFCT = 10 \log \left(\frac{RV}{IV_L}\right).$$

These single event measure data, which were computed from the single event reference data and the reference SPL spectrum extrapolated to each of the 22 profile distances, are frequently identified as "reference file measure data" or "reference file profile data" in the remainder of this OMEGA 10 documentation.

SUBROUTINE CPNL(I,ID)

This subroutine is called from the MAIN routine and subroutine CDIST to compute the perceived noise level (PNL) for the Ith spectrum using the standard method described in several references.[4,5] The PNL quantifies the relative subjective noisiness of different sound spectra and is widely used to assess the annoyance of individual sounds.[6,7] The ID subroutine argument determines whether the PNL data are computed from the mean SPL spectrum of the Ith power setting ($SPLA_{I,J}$ for ID=0) or the extrapolated SPL spectrum for the Ith distance ($SPLX_{I,J}$ for ID=1).

Blank common variables IBNL and IBNH are the indices of frequency bands 17 and 40 (frequencies 50 to 10000 Hz) as required by the PNL algorithm. FJ is a PNL weighting factor defined for the 1/3 octave band data.

Method

PNL is calculated as follows from each 1/3 octave band SPL spectrum (I):

(1) Convert each 1/3 octave band SPL (array SPLA or SPLX) for frequency band indices IBNL to IBNH to perceived noisiness FN_J using function FNOY which defines the noisiness of sound in noy units as a function of frequency and SPL. Also sum these noy values (SUM) and determine the largest value (AMX).

(2) Determine the total perceived noisiness, SUM, as follows:

$$SUM = (FJ)\left[\sum_J (FN_J) - AMX\right] + AMX \qquad \text{noys}$$

where
- FJ = 0.15 for 1/3 octave band data.
- FN_J = perceived noisiness value for frequency index J from Step (1).
- AMX = number of noys in the noisiest band.

(3) Calculate PNL:

$$PNL = 40+33.3 \log (SUM) \qquad \text{PNdB}$$

When one or more SPL data points are beyond the range of the noy algorithm, PNL is set equal to 9999.

FUNCTION FNOY(SPL,JJ)

This function is used by subroutine CPNL to compute the perceived noisiness value (in noys) for a given 1/3 octave band sound pressure level (SPL) using the method described in SAE ARP 865A.[5] Function argument JJ is the frequency band index (numeric value of 1 to 24) corresponding to the 24 frequency bands from 50 to 10,000 Hz and used in data statement arrays FL and FM.

Method

The perceived noisiness value FNOY, in noys, for a particular frequency band (JJ) is related to the band sound pressure level, SPL, by the following equations:

(1) For $FL_{JJ,1} \leq SPL < FL_{JJ,2}$

$$FNOY = 0.1 \text{ antilog } [(FM_{JJ,1})(SPL - FL_{JJ,1})] \quad \text{noys}$$

(2) For $FL_{JJ,2} \leq SPL < FL_{JJ,3}$

$$FNOY = \text{antilog } [(FM_{JJ},2)(SPL - FL_{JJ,3})] \quad \text{noys}$$

(3) For $FL_{JJ,3} \leq SPL < FL_{JJ,4}$

$$FNOY = \text{antilog } [(FM_{JJ,3})(SPL - FL_{JJ,3})] \quad \text{noys}$$

(4) For $FL_{JJ,4} \leq SPL < 150$

$$FNOY = \text{antilog } [(FM_{JJ,4})(SPL - FL_{JJ,5})] \quad \text{noys}$$

(5) For $SPL < FL_{JJ,1}$

$$FNOY = 0.0 \quad \text{noys}$$

(6) For SPL > 150, FNOY is undefined because it is beyond the range of the perceived noisiness algorithm (carried as 5001).

Data statement arrays FL(24,5) and FM(24,4) contain the L_1 to L_4 and M_1 to M_4 versus frequency data listed in Table 3 (from SAE ARP 865A[5]).

TABLE 3

DATA STORED IN ARRAYS FL(24, 5) AND FM(24, 4) IN FUNCTION FNOY[5]

Band Center Freq ency (Hz)	L_1 *	M_1 **	L_2	M_2	L_3	M_3	L_c	M_4	L_4
50	49	0.079520	55	0.058098	64	0.043478	91.01	0.030103	52
63	44	0.068160	51	0.058098	60	0.040570	85.88	0.030103	51
80	39	0.068160	46	0.052288	56	0.036831	87.32	0.030103	49
100	34	0.059640	42	0.047534	53	0.035831	79.85	0.030103	47
125	30	0.053013	39	0.043573	51	0.035336	79.76	0.030103	46
160	27	0.053013	36	0.043573	48	0.033333	75.96	0.030103	45
200	24	0.053013	33	0.040221	46	0.033333	73.96	0.030103	43
250	21	0.053013	30	0.037349	44	0.032051	74.91	0.030103	42
315	18	0.053013	27	0.034859	42	0.030675	94.63	0.030103	41
400	16	0.053013	25	0.034859	40	0.030103	100.00	0.030103	40
500	16	0.053013	25	0.034859	40	0.030103	100.00	0.030103	40
630	16	0.053013	25	0.034859	40	0.030103	100.00	0.030103	40
800	16	0.053013	25	0.034859	40	0.030103	100.00	0.030103	40
1000	16	0.053013	25	0.034859	40	0.030103	100.00	0.030103	40
1250	15	0.059640	23	0.034859	38	0.030103	100.00	0.030103	38
1600	12	0.053013	21	0.040221	34	0.029960	100.00	0.029960	34
2000	9	0.053013	18	0.037349	32	0.029960	100.00	0.029960	32
2500	5	0.047712	15	0.034859	30	0.029960	100.00	0.029960	30
3150	4	0.047712	14	0.034859	29	0.029960	100.00	0.029960	29
4000	5	0.053013	14	0.034859	29	0.029960	100.00	0.029960	29
5000	6	0.053013	15	0.034859	30	0.029960	100.00	0.029960	30
6300	10	0.068160	17	0.037349	31	0.029960	100.00	0.029960	31
8000	17	0.079520	23	0.037349	37	0.042285	44.29	0.029960	34
10,000	21	0.0596401	29	0.043573	41	0.042285	50.72	0.029960	37

*L_1 to L_4 data are stored in FL(24, 5).

**M_1 to M_4 data are stored in FM(24, 4).

SUBROUTINE CPTC(PTC,I,ID)

This subroutine is called from the MAIN routine and from subroutine CDIST to compute the tone correction (PTC) for the I^{th} spectrum. This I^{th} spectrum will be from array $SPLA_{I,J}$ for the I^{th} power setting when the ID subroutine argument is zero (CPTC called from MAIN) or from array $SPLX_{I,J}$ for the I^{th} distance for ID=1 (CPTC called from CDIST). The blank common array $IPTC_I$ is used to store the frequency index (J) of the frequency band which determined the tone correction for the I^{th} spectrum.

This subroutine uses the procedure described in FAR Part 36, Section 36.3.[4] This procedure requires SPL data for 1/3 octave frequency bands 80 to 10,000 Hz; however, this subroutine will compute PTC when SPL data greater than or equal to 20 dB are available for at least 10 consecutive bands within this 1/3 octave frequency band range (only SPL data greater than or equal to 20 dB are used).

Method

Before applying the tone correction procedure, this subroutine determine the largest SPL data point in the spectrum and also the number of consecutive SPL data points greater than 20 dB on each side of this peak value (statement labels 370 to 490). If the total number of points is less than ten, tone correction is undefined (9999) and control is returned to the calling routine. When at least ten points are available, the tone correction procedure is applied over redefined frequency band indicies IL2 to IH1.

The remainder of this subroutine (statement labels 5 to 220) is a direct application of the ten step tone correction procedure defined in FAR Part 36, Section 36.3. The final tone correction is returned in variable PTC. The following comments compare the notation used in the coding and in the FAR Part 36 description:

(1) The frequency band index i in Part 36 corresponds to J in the coding. Spectrum index K doesn't apply because the subroutine operates on one spectrum per call.

(2) Circled SPL data are denoted by variable ICT_J equal to one.

(3) All other variable correspondence should be obvious.

SUBROUTINE CAL(I,ID)

This subroutine is called from the MAIN routine and from subroutine CDIST to compute the A-weighting overall sound level (AL) for the I^{th} spectrum. The subroutine argument ID determines whether the AL data are computed from the mean SPL spectrum for the I^{th} power setting or the extrapolated SPL spectrum for the I^{th} distance. ID is defined the same as in subroutines CPTC and CPNL.

<u>Method</u>

AL is defined as follows:

$$AL_I = 10 \log \left[\sum_J \text{antilog} \left(\frac{SPL_{I,J} + AW_J}{10} \right) \right] \quad \text{dBA}$$

where

J = the frequency band index; J is defined for bands 17 to 40 (indicies 1 to 24).

$SPL_{I,J}$ = the sound pressure level for the I^{th} spectrum or I^{th} distance and the J^{th} band (arrays SPLX or SPLA).

AW_J = the A-weighting relative response in dB for the J^{th} band (see Table 4).

If the AL data are undefined for the I^{th} spectrum, AL_I is set equal to 9999; this should never occur in this program.

SUBROUTINE OUTH(IRD,IPTC,SENX,LFLG,IPF)

This subroutine is called from the MAIN routine to print the SPL spectra versus slant distance on pages H and L and/or the single event noise data (seven measures) versus slant distances on pages I and M. The air-to-ground data (IPROP=1) are printed on pages H and I and the ground-to-ground data (IPROP=2) on pages L and M. Subroutine argument IRD is the index of the profile distance which is

TABLE 4

WEIGHTING FACTORS

Frequency (Hz)	Relative Response (dB)
	A-Weighting
50	-30.2
63	-26.2
80	-22.5
100	-19.1
125	-16.1
160	-13.4
200	-10.9
250	- 8.6
315	- 6.6
400	- 4.8
500	- 3.2
630	- 1.9
800	- 0.8
1000	0
1250	0.6
1600	1.0
2000	1.2
2500	1.3
3150	1.2
4000	1.0
5000	0.5
6300	- 0.1
8000	- 1.1
10000	- 2.5

within 1 percent of the reference distance for this power setting. The remaining arguments are defined in subroutine comment statements. The data format and page layout for each page can best be determined by consulting the sample problem in Appendix C.

Print SPL Spectra

The first segment of this subroutine which is omitted when IPF>2 prints the SPL spectra versus distance data for the 22 profile distances. Subroutine HEAD is called to print the page header block. The statement label 50 loop sets up the integer and variable format arrays and prints each of the 22 spectra. All SPL data less than zero are omitted from the printout (blanked out). The frequency band which determines the tone correction in the reference distance spectrum is flagged with the ">" symbol. The variable format is required to accommodate the blank and flagged data.

Print Single Event Data

The remainder of this subroutine (from label 50) prints the single event versus distance data for the 22 profile distances. The sequence of these seven single event measures in array SENX is determined by the IPF program flag. For IPF≤2, the sequence is PNLTX, PNLX, ALTX, ALX, EPNLX, SELTX and SELX; while for IPF>2, the sequence is EPNLX, SELTX, SELX, PNLTX, PNLX, ALTX and ALX. Neither sequence is the same as the print sequence which is just the reverse of the latter case (IPF>2). Thus, index variable JD is setup to identify the single event data in array SENX in the required print sequence. For the IPF>2 case, variable JD is defined by the ISEQD data statement array which contains the indices of these single event measures in the print sequence. Array ISEQF contains the variable format index corresponding to the JDth single event variable. The data are printed with a variable format to blank out all negative single event data.

Subroutine HEAD is called to print the page I or M header block. The label 100 loop prints the measure data for each distance. The label 80 loop sets up the variable print and format arrays for each measure for the I^{th} distance. These variable arrays are required to blank out data less than zero.

SUBROUTINE OUTJ(IP,SENX,LFLG)

This subroutine is called from the MAIN routine to print the single event measure tab plots for air-to-ground (IPROP=1, pages J and K) or ground-to-ground (IPROP=2, pages N and O) data for the L^{th} power setting. The value of the subroutine argument IP determines the single event measures plotted on each page. When IP is one or four, the PNLTX, PNLX, ALTX, and ALX data are plotted on pages J or N, and when IP is two or three, the EPNLX, SELTX, and SELX data are plotted on pages K and O. This IP program flag also determines the sequence in which these single event data are stored in array SENX. This data sequence is described in detail in subroutine OUTH where program flag IPF is equivalent to IP in this routine. Subroutine argument LFLG is a footnote flag; for LFLG=1, an extrapolation limit flag is printed at the bottom of each page. The plot format and page layout can best be determined by consulting the sample problem in Appendix C.

Method

Each tab plot contains the distance scale on the ordinate and the dB scale on the abscissa. The distance scale always contains the same 22 profile distances from 200 to 25,000 feet. The abscissa scale is 8.3-inches wide and covers an 83 dB range. The maximum abscissa scale value is determined from the measure data for the first ten distances (smallest distances). The maximum annotated scale value is the largest multiple of ten which is less than the largest measure plus eight. The largest plotted point may be one larger than this multiple of ten. All data outside the abscissa scale range are deleted from the plot.

The label 400 loop sets up the plot array and the grid pattern for each profile distance. An identification block is printed in the upper left corner and a legend block is printed in the lower right corner of the grid. These blocks do not normally interfere with the plotted data points; however, they do make the coding more complex and thus more difficult to change.

The label 150 loop scales the three or four (J1 to J2) data points plotted for each distance, sets up the scaled point in the plot array with the correct symbol, and saves the data presently in the plot array. There should be sufficient comment statements in this subroutine to follow the data being printed; thus no additional documentation will be given here.

SUBROUTINE PPFDAT(PRDC,LFLG,COMD,IJ)

This subroutine is called from the MAIN routine to write the profile datasets on file TAPE3 for the L^{th} output power setting (PSC). The TAPE3 file may be equivalenced or copied to the PUNCH file. The air-to-ground and ground-to-ground data are in array PRDC and LFLG is a program flag which when equal to one adds an additional extrapolation limit comment line to each profile dataset. The format and content of these profile datasets is given in Appendix F. There should be sufficient comment statements in this subroutine to follow the data being written.

SUBROUTINE TITPG(IPR)

This subroutine is called from the MAIN routine to print the aircraft title page which identifies the aircraft being analyzed and the data computed in the analysis. The format and content of this page can best be determined by consulting the sample problem in Appendix C. There should be sufficient comment statements in the coding to follow the information being printed. IPR is the program print flag.

SUBROUTINE SETUPD6(IREQ,N,NP,ACC,ITP,IAP,IHP)

This subroutine is called from the MAIN routine to apply the Δ"6 rules to determine the reference data required to compute the profile data at the requested output power setting (PSC). The IREQ, N, NP, ITP, IAP, and IHP subroutine arguments and numerous additional variables are defined in the comment statements at the beginning of this subroutine. Argument ACC is the aircraft code.

Method

This section contains a summary of the Δ"6 rules used in this subroutine and in subroutine DELTA6 to determine the two or four slope reference datasets required to compute the profile measure data for each output power setting (PSC or PSCF). The reference operation power code (OPCR) given on the code sheet identifies the extrapolated reference profile data from which profile measure data for this PSC are interpolated or extrapolated and also determines the operation power description. This OPCR must be in the reference file or data for this PSC are omitted from the computer run. The OPCR and slope reference dataset array indices are stored in array IREQC for each PSC. The Δ"6 rules are defined as follows:

(1) For OPCR equal to 01, 02, 08, 09, 10, 17, 18, or 19, the requested power setting (PSC) must be the same as the reference file power setting (PS). If it is not the same, the PSC data are deleted from the run. For OPCR equal to 17, 18 or 19, the reference file airspeed (IV) must also be the same as the requested airspeed (VX). This rule is applied in this subroutine by labels 360 to 365 within the label 400 loop.

(2) For OPCR equal to 15 or 16 (STOL takeoff and approach), interpolations and extrapolations will be made from the slope of a straight line fit of measure data versus power setting between 15 and 16. Both 15 and 16 must be in the reference file or the requested power setting is deleted from the run. This rule is applied by labels 260 to 300 in this subroutine.

(3) For OPCR equal to 03, 11 or 14 (takeoff, max rated thrust or intermed power (mil)), interpoaltions and extrapolations will be made from the slope of a straight line fit between 05 (approach)

03, 11 <u>or</u> 14. If 05 is missing, the requested power setting will be deleted from the run. It is assumed that only 03, 11 <u>or</u> 14 will be given in the reference file and requested as a Δ"6 reference (OPCR); however, if 03 and 11 or 14 are in the reference file, interpolations and extrapolations will be made from the slope of a straight line fit between 05 and 03. For example, if 03, 05 and 11 are in the reference file and OPCR=11 for one of the requested power settings (PSC), the PSC will be interpolated or extrapolated using the 05 to 03 slope with the 11 reference data as the reference point. This rule is applied between labels 20 and 40 and labels 160 and 180 in this subroutine.

(4) For an OPCR equal to 05 (approach) and a PSC greater than or equal to the approach power setting, interpolations and extrapolations will be made from the slope of a straight line fit between 05 and 03 (takeoff) or 05 and 11 or 14. When the PSC is less than the approach power setting, the interpolations and extrapolations will be made from the slope of a straight line fit between 05 and the highest ranking power setting less than approach as defined in item 6 below. If there is no reference file power setting less than appraoch, the PSC is extrapolated using the 05 and 03 slope. This rule is applied by labels 180 to 200 in this subroutine.

(5) For an OPCR equal to 12 (normal rated thrust), extrapolations will be made from the slope of a straight line fit between 05 (approach) and 03 (takeoff). The OPCR equal to 12 reference measure (PNLX, PNLTX, ALX, ALTX, SELX, SELTX or EPNLX) data are used as the slope reference point. The program assumes that the requested power setting (PSC) and the reference file power setting (PS) for OPCR=12 are between the reference file 03 and 05 power settings; if the PSC is not, a warning message is printed and the data are still extrapolated from the 03 to 05 slope line. This rule is applied by labels 230 to 250 in this subroutine.

(6) For an OPCR equal to 04, 06, 07, or 13 the reference file is searched for all the 04, 06, 07, and 13 operation power codes which have a power setting less than the 05 (approach) power setting. If two or more are found, they are ranked in the following highest to lowest ranking order: 13, 06, 04, and 07.

If the reference measure (PNLX, PNLTX, etc) data at the reference distance (1000 feet) for the highest ranking power setting is less than the reference measure data at approach power (05), then the slope of a straight line fit between this highest ranking power setting and the approach power will be used for all interpolations or extrapolations for power settings less than approach. If the reference measure data at the reference distance for the highest ranking power setting is greater than or equal to the reference measure data at approach power (05), there are no corrections to the data (ie., slope=0) for power settings less than approach power. Next one of the following four items applies depending on the magnitude of PS and PSC relative to the approach power.

(a) When the reference file power setting (PS) and the requested profile power setting (PSC) are greater than or equal to the approach reference file power setting, extrapolations are made from the slope of a straight line fit between 03 (takeoff) and 05 (approach). This slope line uses the OPCR measure data and power setting as the reference point.

(b) When the reference file power setting (PS) and the requested profile power setting (PSC) for one of the above OPCR's are both less than the approach reference file power setting, all interpolations or extrapolations are made from the slope of a straight line fit between the approach and highest ranking power settings as explained in item (6) above (slope may be zero).

(c) When the reference file power setting (PS) for one of the above OPCR's is greater than the approach reference file power setting and the corresponding profile power setting (PSC) is less than the approach reference file power setting, the extrapolations are made in two steps. First, the measure data are extrapolated to the approach power setting using the slope of a straight line fit between the measure data at approach power and the measure data at takeoff power, with the OPCR measure data and power setting as the reference point. Second, the measure data are extrapolated from the approach power to the requested power setting (PSC) using the slope of a straight line fit between the measure data at approach

power and the highest ranking power setting less than approach as described in item (6) above. This second slope may be zero. If there are no reference file power settings less than approach, the takeoff to approach slope is used to compute the requested power setting data (PSC).

(d) When the reference file power setting (PS) for one of the above OPCR's is less than the approach reference file power setting and the corresponding profile power setting (PSC) is greater than the approach reference file power setting, the extrapolations are, once again, made in two steps. First, the measure data are extrapolated to the approach power setting using the slope of a straight line fit between the measure data at approach power and the measured data at the highest ranking power setting less than approach, with the OPCR measure data and power setting as the reference point as described in item (6) above (this slope may be zero). Second, the measure data are extrapolated from the approach power to the requested power setting (PSC) using the slope of a straight line fit between the measure data at approach and takeoff power settings. If there is no reference file takeoff power setting, the first slope is used to compute the requested power setting data.

Note that each reference to takeoff power (03) in items (a) through (d) could be replaced by max rated thrust (11) or intermediate power (mil) (14) when takeoff power is not in the reference file. Parts of this rule are applied in this subroutine between labels 55 and 90 and labels 365 and 360; however, those parts which require that the measure data be checked or which require a two step extrapolation are applied in subroutine DELTA6.

(7) No extrapolations at the 1000 foot reference distance for air-to-graound SELX (or SELTX or EPNLX when only one measure is computed) data may exceed 5 dB. If the 5 dB limit is exceeded, a new power setting (PSC) corresponding to this 5 db limit is computed using the same straight line fit slope. The comment "Power setting extrapolation limited by AFAMRL/BBE, WPAFB" is added to each profile dataset (4^{th} comment card) and printed at the bottom

of output pages I, K, M, and O and on the summary page. This extrapolation limit is checked for each segment of the two step extrapolations in items 6c and 6d above. This rule is applied in subroutine DELTA6 described in the next section.

All references in the above Δ"6 rules to straight line fits between specific operation power codes is assumed to mean a straight line fit between PNLX, PNLTX, ALX, ALTX, SELX, SELTX or EPNLX measure versus power setting data for those operation power codes. Extrapolation or interpolation of data is assumed to mean the extrapolation or interpolation of the measure (PNLX etc.) data for a given power setting. This straight line fit algorithm is defined and applied in subroutine DELTA6.

This subroutine defines the indices of the slope (as required) and OPCR reference datasets in array IREQC for each output power setting (PSC) as required in items 1 to 6 above. In item (6c) and (6d) where two slopes are required, the second slope points are determine in subroutine DELTA6. Actually, almost all item 6 logic is defined in subroutine DELTA6; only the highest ranking power setting less than approach, the first slope indices, and the OPCR index are determined in this subroutine. There should be sufficient comments in this subroutine to follow the coding of the above rules. The flowchart in Figure 5 may also be an aid in following the coding and determining what rules are applied in this subroutine.

When new operation power codes are added to the NOISEFILE flight noise database, they must be added to the data statement array OPP and the above rules must be modified to account for the new power codes.

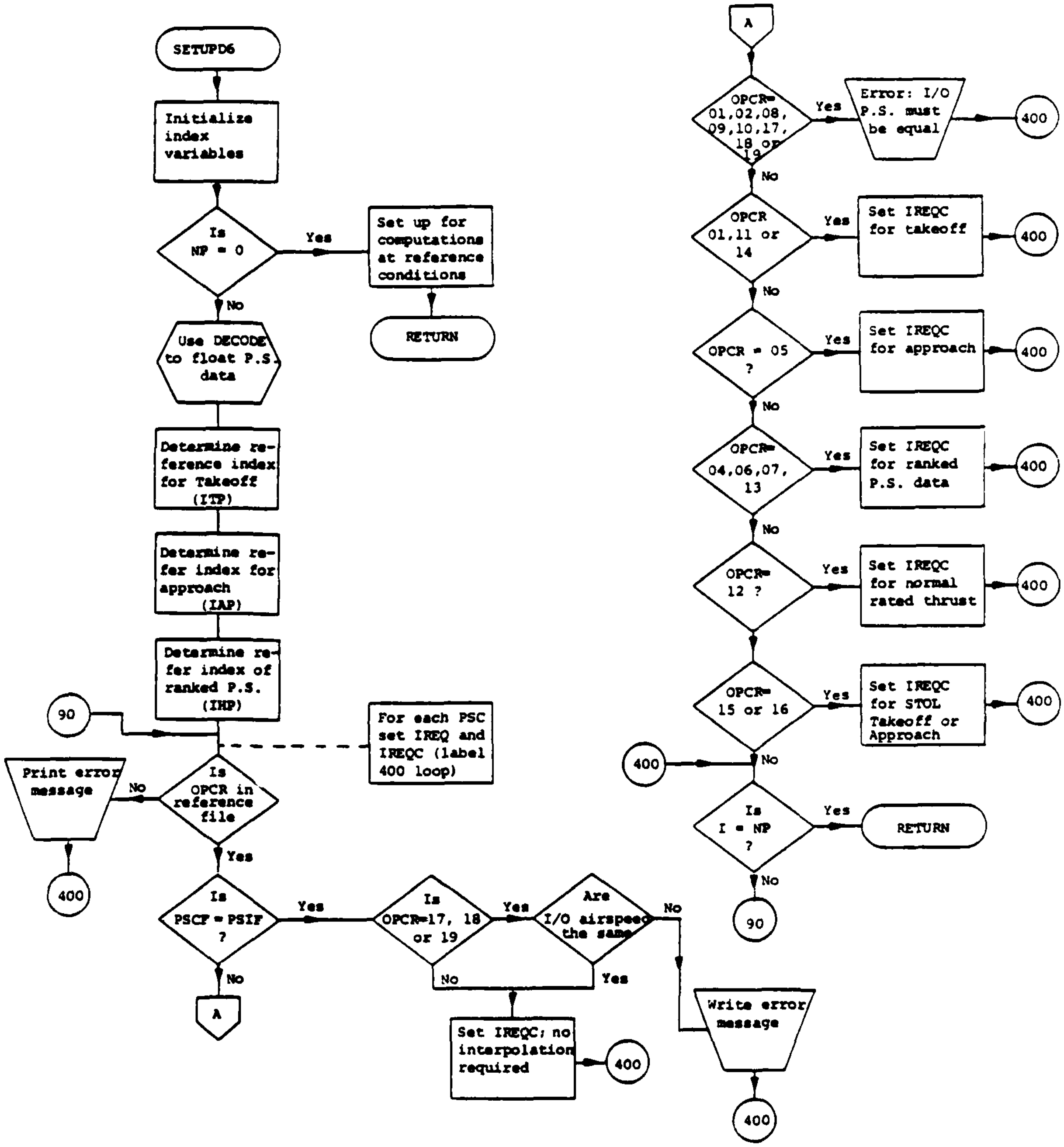


Figure 5. Flowchart for Subroutine SETUPD6.

SUBROUTINE DELTA6(PRDI,PRDC,K,PSIF,PSCF,IREQC,LFLG,VFCT,LIM,PSC,EXTMX, ITP,IAP,IHP,IREF)

This subroutine is called from the MAIN routine to apply the Δ6 algorithms in computing the final flight noise PNLX, PNLTX, ALX, ALTX, SELX, SELTX and EPNLX profile data at the requested power setting (PSC) and airspeed. All the subroutine arguments are defined in the comment section at the beginning of this subroutine (source listing). The term "reference file measure data" used in the following paragraphs is the measure data (PNLX, etc) derived from the SPL reference spectrum after it is extrapolated to each of the 22 profile distances (see subroutine CDIST).

Method

The following linear interpolation (or extrapolation) function (F) is defined in this subroutine and used to compute the single event noise measures at each profile distance:

$$YC = \left(\frac{Y2-Y1}{X2-X1}\right)(XC-XB) + YB$$

where

- YC = the interpolated or extrapolated measure data for the PSC power setting (array PRDC);
- Y1 and Y2 = the reference file measure data used to compute the slope (array PRDI);
- YB = the reference file measure data reference point defined by OPCR (array PRDI);
- X1 and X2 = the reference file power setting data used to compute the slope (array PSIF);
- XC = the requested power setting (array PSCF); and
- XB = the reference file power setting defined by OPCR (array PSIF).

The airspeed adjustment factor (VFCT) is subtracted from this YC data where

$$VFCT = 10 \log \left(\frac{VX_L}{RV}\right)$$

VX_L = profile output airspeed (knots) for L^{th} PSC.

RV = program reference airspeed (presently 250 knots).

The linear interpolation algorithm used to compute the limiting power setting when the noise level extrapolation limit (EXTMX) is exceeded is:

$$XC = XB + \left(\frac{YL-YB}{Y2-Y1}\right)(X2-X1)$$

where

XC = the new PSC power setting (PSCF) corresponding to the limiting measure value (YL); and

YL = the limiting measure value ($YL=YB\pm EXTMX$), YL is EXT in the program.

All other variables are defined above.

There should be sufficient comment statements in the source listing to follow the coding; however, the following outline of this subroutine may be helpful. The principle segments of this subroutine are:

(1) The statement label 40 loop applies the above interpolation function and airspeed adjustment to compute the measure data for all Δ"6 rules except rule one and part of rule six (see subroutine SETUPD6).

(2) The statement label 80 loop applies the airspeed adjustment to compute the measure data when no Δ"6 adjustments are required.

(3) Label 100 sets the LFLG program flag when insufficient data were available to compute the measure data.

(4) The label 110 to 150 (exclusive) segment checks the measure and power setting data at the 1000 foot reference distance to determine if the reference (PS) and output (PSC) power settings are on opposite sides of approach power or if the measure data for the highest ranking power setting less than approach power are greater than the measure data at approach power.

(5) The label 150 to 200 segment checks the extrapolation limit for the first measure data computed at the 1000 foot reference distance for each power setting. If the limit is exceeded, a new power setting is computed and set up in array PSCF.

(6) The remainder of this subroutine (labels 250 to 485) computes the measure data for cases where the reference (PS) and requested (PSC) power settings are on opposite sides of the approach power setting (see Δ"6 rules (6c) and (6d) in the subroutine SETUPD6 documentation). The computation of these measure data requires two extrapolations; first, the measure data are extrapolated from the reference power setting (PS or PSIF) to the approach power setting and then from the approach power setting to the requested output power setting (PSC or PSCF). These extrapolations use the approach to takeoff slope and highest ranking power setting less than approach to approach slope in the sequence determined by the given data. The second slope references are coded in the IREF program flag array.

SUBROUTINE SUMRY(IPU,COMD,EXTMS,N,NP,SOURCE,LFLG,IREF,ITP,IAP, IHP)

This subroutine is called from the MAIN routine at the end of each aircraft analysis to print a summary of the input and output data for that aircraft. The subroutine arguments are:

(1) IPU is the profile dataset print (on TAPE3) flag;

(2) COMD contains the last 5 characters of the reference dataset comdeck name;

(3) EXTMX is the maximum extrapolation error permitted by the program (see subroutine DELTA6);

(4) N is the number of input power settings (PS);

(5) NP is the number of output power settings (PSC);

(6) SOURCE contains the date of the original reference dataset run;

(7) LFLG is a flag defined for each output power setting (see subroutine DELTA6);

(8) IREF is a flag which is greater than zero when two slope lines were used to extrapolate the measure data (required when reference and output power settings are on opposite sides of approach power);

(9) ITP, IAP, and IHP are the indices of the reference file data for takeoff, approach, and the highest ranking power setting less than approach power.

If the sample problem in Appendix C is used as a guide, there should be sufficient comment statements in this subroutine to follow the data being printed.

GENERAL OVERVIEW OF THE OMEGA 11 PROGRAM

The OMEGA 11 program, hereafter referred to as simply the "program", is designed to compute descriptions of the ground run-up noise of an aircraft in terms of tone-corrected perceived noise level (PNLTX), A-weighted overall sound level (ALX), and tone-corrected A-weighted overall sound level (ALTX) as a function of distance to the aircraft, aircraft power setting and meteorological conditions. These noise measure data (profile datasets) are computed for aircraft ground run-up reference data as outlined in AMRL-TR-73-107.(1) They are required as input to the NOISEMAP noise exposure forecast program and also are the ground run-up part of the NOISEFILE 3 database.

To compute the above noise measure data for selected operation power settings, the program inputs all reference datasets for aircraft ACC from the NOISEFILE 4 database. These reference datasets contain sound pressure level (SPL) data for 19 angles normalized to a reference distance of 250 feet and to standard day temperature (59°F), relative humidity (70%) and barometric pressure (29.92 inches Hg). The format of these data are described in Appendix G.

These reference spectra are then extrapolated to each of the 22 standard profile distances (from 200 to 25,000-feet) at the requested standard or non-standard weather conditions. PNLTX, ALX and ALTX noise measures are determined for each distance and angle from these extrapolated SPL spectra for the reference power setting. This program interpolates between two reference file power settings to compute the noise measure data for each power setting requested on the code sheet. Noise measure data can be computed for any power setting within the range available in the reference file.

A brief summary of the program operation is given below:

(1) The program inputs the code sheet parameters described in Appendix B and reads the reference datasets for aircraft ACC from the TAPE7 reference file.

(2) The power setting data are ranked and the indices of the reference datasets required to interpolate each output power setting are defined.

(3) The cover page is printed whe IPR is greater than zero.

(4) The aircraft summary page is printed.

(5) If Delta N (DELN) is not zero, it is added to all spectra for all power settings.

(6) If print flag IPR is greater than zero, all reference datasets are printed.

(7) PNLTX, ALX and ALTX profile data for each requested power setting (PSC) are computed (in sequence from low to high PSC):

(a) If the PSC is the same as one of the reference dataset power settings, the profile data are computed and no interpolation is required.

(b) If the PSC is not the same as a reference dataset power setting, the profile data are computed at the reference conditions for the nearest reference file power settings on each side of PSC and the PSC profile data are linearly interpolated. For many PSC's, the reference profile data for at least one dataset will have been computed for the previous PSC and thus stored in the SENX array.

(8) If IEDIT equal zero, the PSC profile data are edited to select the 10 angles which best represent the profile dataset at the reference distance.

(9) For IEDIT greater than or equal to zero, all PNLTX, ALX and/or ALTX profile data are written on file TAPE2 as requested by the MEAS program flag.

(10) For IPR greater than zero, the PNLX, PNLTX, ALX and/or or ALTX profile data page are printed as requested by the MEAS flag. A plot is also printed for PNLTX, ALX and ALTX at the reference distance.

The content and format of the above mentioned output can best be determined by consulting the sample problem in Appendix D.

The CDC FORTRAN extended (FORTRAN IV) computer language was used for the entire program. The common and subroutine features of the language were used extensively throughout the program to save computer time and core.

The following sections describe the detailed tasks accomplished by the program. It is intended to document the procedures within each subroutine at a level useful to either a programmer reading this while working with the code or a reader simply interested in what happens with a specific subroutine. The algorithms used to compute the noise measures are described in detail in the individual subroutines.

GENERAL ORGANIZATION OF THE OMEGA 11 PROGRAM

The general organization of the entire program is shown in Figure 6. The arrows indicate access to the various routines rather than program flow; for example, MAIN calls subroutine CDIST which in turn calls subroutine CPNL, CPTC and CAL and subroutine CPNL calls function FNOY. The circled numbers indicate the input (TAPE5) and output (TAPE2, TAPE6) files. Since the TAPE6 file (equivalenced to the OUTPUT file) is written by numerous routines throughout the program, the circled six is omitted from the figure.

Using Figure 6 as a guide, this section summarizes in very general terms the functions performed by the entire program. This is meant to serve as an introduction for the reader to the functions of the individual subroutines.

The control routine, MAIN, reads the job control card and initializes several program and test variables. Subroutine TESTN is then called to read the code sheet test parameters, initialize numerous test variables; and call subroutine ALPH to compute the atmospheric absorption data for non-standard temperature and relative humidity.

Next the MAIN routine initializes additional test parameters and calls subroutine RSPLN to read all reference datasets for aircraft ACC from file TAPE7. The power settings from these reference datasets as well as the output power setting data are ranked by subroutine RANK which also determines the reference datasets required to compute the profile data for each output power setting.

The cover (IPR>0) and summary pages are printed by subroutines TITPG and SUMRY, respectively. Delta N (DELN) is added to all reference spectra (for DELN≠0) which are then printed (IPR>0) by the MAIN routine.

Subroutine CDIST is called to compute the PNLX, PNLTX, ALX and/or ALTX profile data (as requested by the MEAS flag) for the reference dataset power settings required to interpolate the output

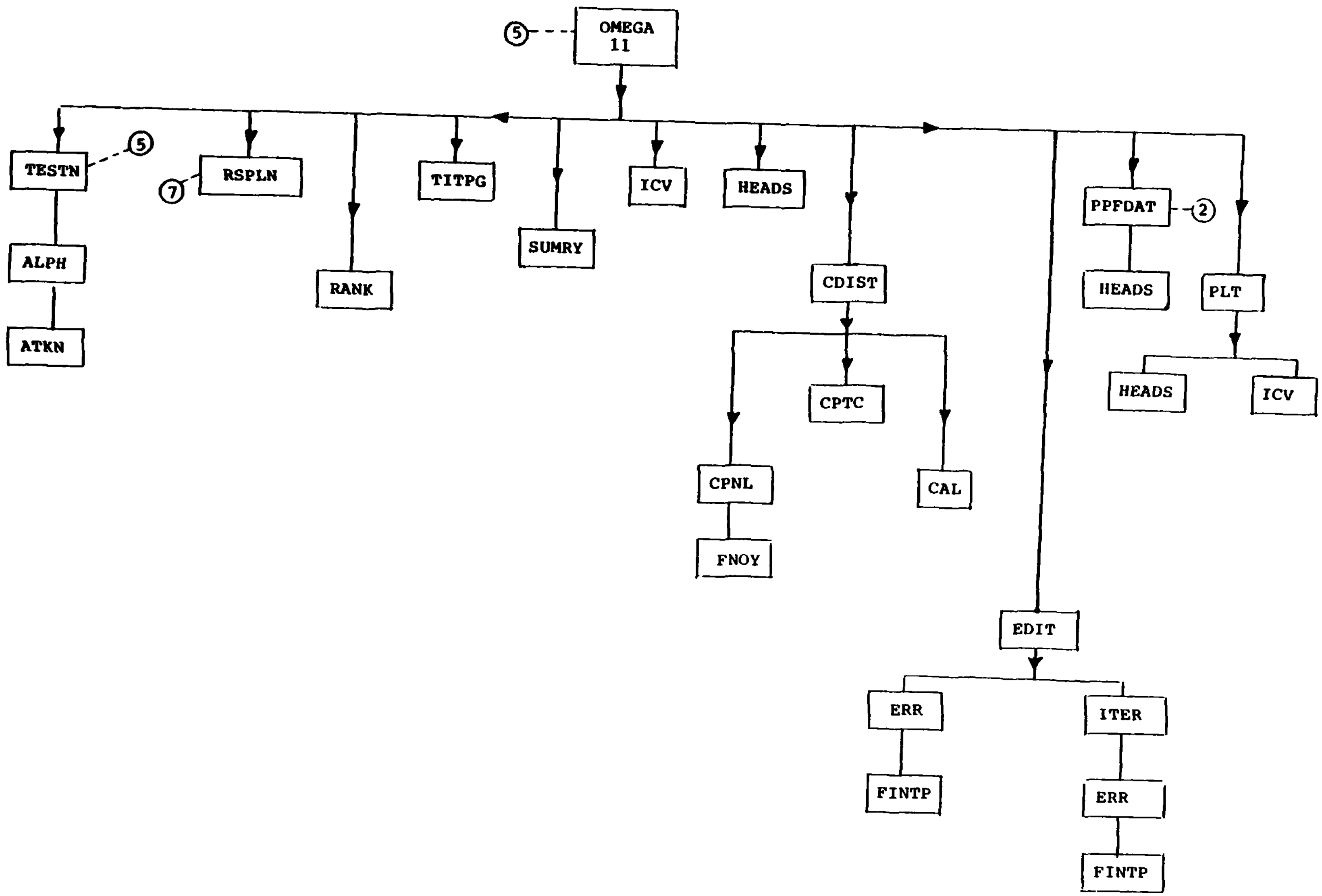


Figure 6. General Organization of OMEGA 11 Program.

power settings (PSC). This interpolation between power settings is performed by the MAIN routine. Subroutine CDIST calls subroutine CPNL, CPTC and CAL to compute the PNLX, tone correction, and ALX data. These interpolated profile data are edited (IEDIT=0) by subroutine EDIT to select the 10 angles which best describe the profile data at the reference distance. EDIT calls subroutine ERR which uses linear interpolation between the selected angles to determine how well they represent the profile function. The FINTP linear interpolation subroutine is used by subroutine ERR. EDIT also calls subroutine ITER which attempts to reduce the interpolation errors by selecting the angles with the largest errors; ITER also calls ERR.

Subroutine PPFDAT writes the profile datasets on file TAPE2 (for IEDIT≥0) and prints (IPR>0) the tab output pages for all computed measures. Subroutine PLT prints (IPR>0) a tab plot of the PNLTX, ALX and ALTX noise level versus angle data computed for the reference distance. The angles for which profile data are written on TAPE2 are listed below the tab plot.

After computing and printing the profile data for each of the NP power settings, control is returned to label 10 in the MAIN routine and the program repeats the above for the next aircraft (or until an end of file is read from the INPUT file).

DEFINITIONS OF SYMBOLS AND TERMINOLOGY USED IN THE OMEGA 11 PROGRAM

The symbols defined here are used in this report and/or in the OMEGA 11 program source listing. They are a subset of the complete symbol versus reference list given in the SUPER INDEX in Appendix J. Many of the symbols given in the SUPER INDEX are really dummy variables used in only one or two routines and redefined in each routine; most of these symbols are not included in this list of symbol definitions. Symbols which are arrays will be listed with their array dimensions. Variables I, J and K are usually but not always used as array subscripts as follows:

(1) The subscript "I" is a running index associated with any one spectrum (angle). It is also frequently used as a "dummy" index to initialize variables.

(2) The subscript "J" is a running index associated with any one band in the set of octave or 1/3 octave frequency bands. It is also an index associated with a specific profile measure.

(3) The subscript "K" is a running index associated with any one profile distance.

SYMBOL	DESCRIPTION
ACC	Three character aircraft code read from the code sheet and printed on all output pages and in all output datasets.
ALTX(19,22,2)	Profile tone-corrected A-weighted overall sound level in dBA for each angle and profile distance for two power settings.
ALX(19,22,2)	Profile A-weighted overall sound level in dBA for each angle and profile distance for two power settings.
ATN(24)	Data statement array containing the atmospheric absorption coefficients in dB per 1000 for standard day temperature and relative humidity.
ATN8(24)	Atmospheric absorption coefficients in dB per 1000 feet for OMEGA 11 profile output temperature and relative humidity.
ATNC(24)	Atmospheric absorption coefficients in dB per 1000 feet for OMEGA 11 reference input temperature and relative humidity (usually standard day conditions).
AW(24)	A-weighting coefficients in dBA.
BLK	A data statement variable containing a blank Hollerith character used in printing variable format data.
CRI	Comdeck revision identifier (see code sheet).
CXD(19)	Computed tone correction for each angle for the reference distance (dB).
DATE	Date of computer run (see code sheet).
DATN(6)	Date of the OMEGA 8 computer run which generated the reference dataset.
DELN	Noise adjustment factor added to the reference spectrum (dB).
DIST	Distance in feet to which the reference file data in NOISEFILE 4 are normalized (presently 250 feet).
EA(13,13)	Excess atmospheric attenuation in dB for bands 17 to 29 and distances 400 to 6300 feet (subroutine CDIST).
ER(19,3)	Profile dataset angle selection error data for each angle and measure (dB).

SYMBOL	DESCRIPTION
ERMAX	Maximum acceptable angle selection error in dB; no attempt is made to improve the angle selection for errors less than ERMAX.
FIMPR8	Characteristic impedance ratio using reference and profile output temperature and barometric pressure.
FJ	Constant used in the perceived noise level computations; FJ=0.15 for 1/3 octave band data.
FL(24,5)	Data statement array used in noy computations (functions FNOY) containing the band sound pressure levels in dB given in Table 3.
FM(24,4)	Data statement array used in noy computations (function FNOY) containing the reciprocals of the slopes given in Table 3.
FMT(22)	Variable format array used to print profile data in subroutine PPFDAT.
FMXER	Maximum angle selection error permitted without an error message being printed (see code sheet).
FREQ(24)	Data statement array containing the frequency values in Hz in character format for printing.
FREQ3(24)	Geometric mean and lower limiting frequencies required to compute atmospheric absorption coefficients for 1/3 octave band data.
FSPL(19,24,6)	Normalized reference SPL in dB for each angle, frequency band, and operation power code.
IBNH	Largest band number index (24 corresponds to band 40).
IBNL	Initial band number index (1 corresponds to band 17).
IC	Index which is usually associated with output power setting (PSC) data.
IEDIT	Program flag which controls the quantity of profile data written on file TAPE2 (see code sheet).
IFC(6)	Program flag used to flag special case output power setting data (see code sheet).
IFCC	Index used to count the number of IFC's > 0.
IFI(6)	Program flag used to flag special case (Afterburner, etc.) reference file power setting data.

SYMBOL	DESCRIPTION
IFII	Index used to count the number of IFI's > 0.
IH	Index of the largest frequency band defined for this test (IH=24 for band 40).
IH8	Profile output relative humidity (code sheet input).
IHH	Reference relative humidity (70%).
II	Index which is frequently associated with the computation of the two sets of profile data used to interpolate profile data at the requested power settings.
IL	Index of the lowest frequency band defined for this test (IL=1 for band 17).
IPR	Program print control flag (see code sheet).
IR(19)	Array used to print integer values of the reference SPL data.
IRD	Profile distance index which corresponds to the reference minimum slant range (presently IRD=2).
IREQ(2,6)	Index of the one or two reference datasets required to compute the profile data for each requested power setting.
IT	Reference temperature in degrees F (always 59°F).
IT8	Profile output temperature in degrees F (see code sheet).
IVER	Program version code.
L	Index frequently associated with data for a specific reference file power setting.
M	Program flag indicating whether data are for octave (M=1) or 1/3 octave (M=3) band center frequency (always 3 in this program).
MEAS(3)	Program job control variable which flags the profile measures to be computed (see code sheet).
MM	Increment of the frequency index (one for 1/3 octave band data).
N	Number of reference dataset operation power codes read from the reference file (TAPE7) for aircraft ACC.

SYMBOL	DESCRIPTION
NC	Number of angles for which SPL spectra are defined in the reference dataset (always 19 for the present reference datasets).
NN	Maximum number of reference file operation power codes permitted for each aircraft (NN=6).
NP	Number of output operation power codes (power settings) to be computed for this aircraft.
NPM	Maximum number of profile operation power codes permitted for each aircraft (NPM=6).
NR(17,3)	Change in slope rank data computed in the angle selection routines for angles 10 to 170 degrees for each measure. Angles with rank greater than nine are included in the final profile dataset.
NRC(6)	NRC(K) contains the index of the output power setting data (in arrays PSC and PSCF) whose power setting rank is K.
NRI(6)	NRI(K) contains the index of the reference power setting data (in arrays PS and PSIF) whose power setting rank is K.
OPC(6)	Reference operation power codes.
OPCC(6)	Output operation power codes.
OPCSP(8)	Special case operation power codes for which no interpolation is permitted. This array must be updated when new codes are added.
OPD(2,6)	Power description data for each reference operation power code (20 characters).
OPD1, OPD2	Power description data defined for output power settings when the reference and output power settings are the same.
P1	Reference barometric pressure in inches Hg (always 29.92 inches Hg).
P8	Profile output barometric pressure in inches Hg.
PNLTX(19,22,2)	Profile tone-corrected perceived noise level in PNdB for each angle and distance for two power settings.
PNLX(19,22,2)	Profile perceived noise level in PNdB for each angle and distance for two power settings.

SYMBOL	DESCRIPTION
PS(6,6)	Power setting data for each reference file operation power code (power setting value and units in character format).
PSC(6)	Power setting data for each profile output operation power code in character format (see code sheet).
PSCF(6)	Numeric form of PSC(6) data defined above.
PSIF(6)	Numeric form of the first power setting for each reference operation power code in PS(6,6) above; eg. PSIF(I)=PS(1,I).
PSU	Power setting units for the profile output data.
PTC	Tone correction in dB.
PV	Profile version code (see code sheet).
RMS(3)	Root mean square of the angle selection error for each measure.
RUN(6)	Two character run number from each reference dataset.
RUNC(6)	Data statement array containing run numbers 01 to 06 in character format. These run numbers are assigned to the output data in power setting sequence.
SENX(19,22,12)	Array equivalent to arrays PNLX through SENXD in blank common where SENXD(19,22,4) contains the interpolated profile data for the measures.
SPLX(19,24)	Profile sound pressure level in dB for each angle (spectrum).
SX(22)	Distance data in feet for the 22 profile distances.
T12(2)	Data statement array used to set up the variable formats for the profile data tab output.
TAPE2	File on which datasets are written; TAPE2 may be copied or equivalenced to the PUNCH file.
TAPE5	Input file for all input data; TAPE5 is equivalenced to the system INPUT file.
TAPE6	Output file on which all tab output are printed; TAPE6 is equivalenced to the system OUTPUT file.
TAPE7	Reference dataset input file.

SYMBOL	DESCRIPTION
TEST(6)	Ten character test number from each reference dataset.
TT(6,6)	Two lines of 25 characters from the reference dataset describing the noise source. The two lines from the first reference dataset are printed in the Noise Source/Subject block on all output pages.

DETAILED DESCRIPTION OF THE OMEGA 11 PROGRAM

This section discusses the MAIN routine and each subroutine in the OMEGA 11 program. Procedures within most routines are documented at a level useful to a programmer reading this while working with the code or a reader interested in what happens within a specific subroutine. Most routines contains numerous comments which should be very helpful in following the code.

The program algorithms and I/O are discussed in the routines in which they are coded. The program code sheet in Appendix B and the sample problem in Appendix D are referenced to simplify the description of the input and output. The more complex subroutines are supplemented by flowcharts drawn from the point of view of function performed rather than block instructions.

COMMON VARIABLES

Extensive use is made of common in the program for communications between the various routines. Many of the storage locations in blank common are used in different ways or with different variable names throughout the program to save core. Several of the large arrays are included in blank common rather than labeled common because on the CDC 6600 computer a large blank common reduces the total core required to load and execute the program. The variables used in labeled common are usually of a similar type and/or used in many of the same subroutines.

The variables assigned to blank and labeled common in the MAIN routine and the total common length are listed in Table 5. The subroutines in which the labeled common are used are listed in Table 6. All blank and labeled common are included in the MAIN routine. All common variables are defined in the complete list of symbols at the beginning of the report. The blank and labeled common are described in the following paragraphs.

TABLE 5

MAIN ROUTINE VARIABLES IN BLANK AND LABELED COMMON

		Labeled Common	
	Blank Common	ATTNC	HEADC
	M	ATNC(24)	TEST(6)
	MM	ATN8(24)	TT(6,6)
	IL	SX(22)	DATE
	IH		RUN(6)
	NC		IPAGE
	L		IVER
	N		ACC
	ID		OPC(6)
	DIST		IT
	MEAS(3)		P1
	FSPL(19,24,6)		IHH
	SPLX(19,22)		IT8
	PNLX(19,22,2)		P8
	PNLTX(19,22,2)		IH8
	ALX(19,22,2)		FIMPR8
	ALTX(19,22,2)		PV
	SENXD(19,22,4)		CRI
	IR(19)		PS(6,6)
	IPRCK(6)		OPD(2,6)
	DMY(202)		OPCC(6)
			DELN
			PSC(6)
			PSU
			NP
			PSIF(6)
			PSCF(6)
			NRC(6)
			ICC
			OPCDM
			OPD1
			OPD2
			COMD(6)
			RUNC(6)
			IC
			DATN(6)
			IFC(6)
			IFCC
			IFI(6)
			IFII
Length	8447	70	185

TABLE 6

SUBROUTINES CONTAINING THE LABELED COMMON

ATTNC	HEADC
CDIST	HEADS
TESTN	PPFDAT
	RANK
	RSPLN
	SUMRY
	TESTN
	TITPG

Blank Common

The 8447 storage locations used by blank common in the main routine are the maximum required in any routine in the program. Almost all routines use some blank common but only few require the 8447 locations. The variable names assigned to blank common vary throughout the program. Most variables are defined to communicate with several subroutines and then redefined for the next series of routines. In several cases variables are changed or equivalenced to simplify the computations and/or output routines.

ATTNC Common

These variables are used to extrapolate data from a given set of distance and weather conditions to a new set of conditions. For example, from reference distance and standard day conditions to the profile distances at the profile temperature and humidity. These 70 storage locations are defined the same throughout the program.

HEADC Common

These variables are primarily output variables required to identify the data being analyzed. Most of these data are printed in the page header blocks and the output COMDECK comment cards. The storage locations are defined the same throughout the program.

MAIN PROGRAM

MAIN is the executive routine for the entire OMEGA 11 program. Its principal function is to call the subroutines required to read the input data, perform the data analysis, and write the tab and data file outputs. However, the program also reads the program control parameters, initializes numerous test variables, interpolates the profile noise levels as a function of power setting, and prints part of the output. The MAIN routine is discussed in the following paragraphs using the program listing in Appendix J, the flowchart in Figure 7, and the sample problem in Appendix D as guides.

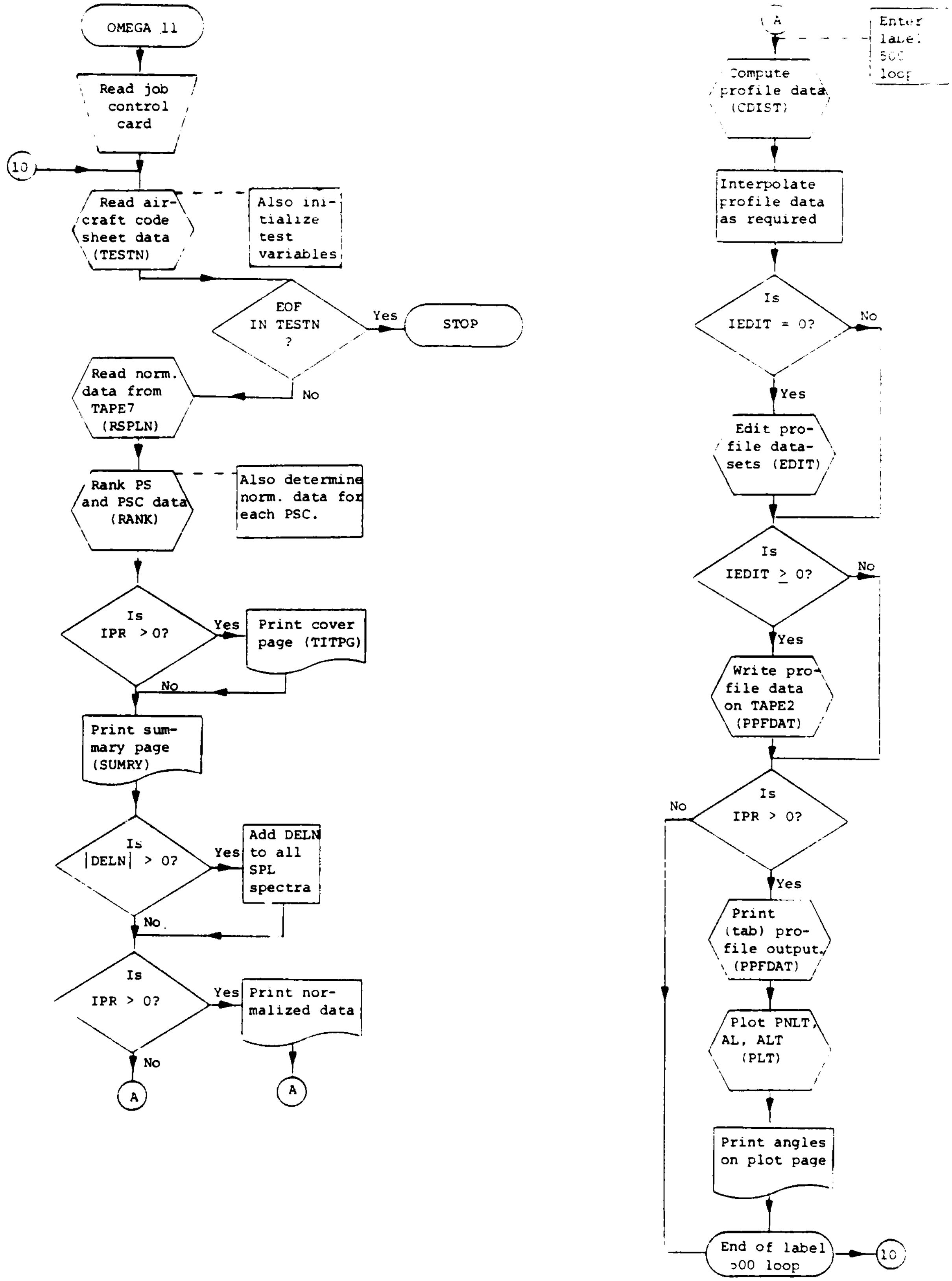


Figure 7. Flowchart for OMEGA 11 MAIN Routine.

Data Statement Arrays

The FREQ data statement array contains frequency data (Hz) in character format which is printed in the frequency versus SPL listings of the reference datasets.

Initialize Test Variable

The first segment of this routine performs the following variable initialization steps:

(1) The SX standard profile distance array is evaluated:

$$SX_I = \text{antilog}\left(\frac{I+22}{10}\right) \qquad \text{feet}$$

where I is the distance index running from 1 to 22.

(2) The code sheet job control card is read once per execution of the program.

(3) Subroutine TESTN is called to read all test (aircraft) code sheet parameters and initialize numerous other test variables based on these code sheet input data (eg. atmospheric absorption data).

Read Reference Data

The program calls subroutine RSPLN to read the reference data for aircraft ACC from file TAPE7. TAPE7 may contain data for numerous aircraft, however, all data for aircraft ACC must be back to back. All reference data (for ACC) for normal power settings are stored in the program; the special case (afterburner, etc.) power setting data are stored only when at least one special case output power setting is requested. Note that array OPCSP in subroutine RSPL must be updated when new special case OPC's are added to NOISEFILE.

Setup Interpolation Index Array

Subroutine RANK is called to rank from low to high the input and output power setting data. These ranked power setting data are used to determine the reference data required to interpolate the profile data for each output power setting. The indices of these reference data are stored in array IREQ.

Subroutine TITPG prints the cover page when flag IPR is greater than zero. Subroutine SUMRY uses the above IREQ array data to print the aircraft summary page which is the only tab output when IPR is less than one.

Adjust and Print Reference Data

The following constant is computed as required by subroutine CDIST later in the program:

$$D1 = 10 \log (FIMPR8) + 20 \log (DIST)$$

where

FIMPR8 = the characteristic impedance ratio computed in subroutine TESTN.

DIST = the reference distance in feet.

The statement label 55 loop checks array IREQ to determine which reference data are actually required for this aircraft analysis. If Delta N is not equal to zero, it is added to all spectra in these required datasets which are then printed when flag IPR is greater than zero. Subroutine HEADS prints each reference page header block. The overall SPL is also computed and printed below the last SPL band. The overall SPL is defined as follows:

$$\text{Overall SPL} = 10 \log \sum_{J} \text{antilog} \left(\frac{FSPL_{I,J,L}}{10}\right)$$

where

$FSPL_{I,J,L}$ = reference band SPL in dB at distance DIST and for angle index I, band index J, and power setting index L.

Single Event Profile Data

The statement label 500 loop computes the single event profile noise data for each of the NP power settings (PSC). Each of the NP power settings will require profile data from one reference dataset when the PSC is the same as a reference power setting or from two reference datasets when the PSC must be interpolated. The dataset indexes required for each PSC are stored in array IREQ. Subroutine

CDIST computes the profile data requested by the MEAS flag (PNLTX, ALX and/or ALTX) for each reference dataset.

Note that profile data are computed and stored for no more than two reference datasets at any one time; however array IREQ is set up and checked to avoid duplicate computations. This limit of two was set to keep the program core size below 60000_8.

When no power setting interpolation is required, the final profile data are stored in array SENX (by subroutine CDIST) as indicated in the program comment statements (see label 370 and 380). When the PSC are not the same as a reference file power setting, the profile data are interpolated for each angle (I) and distance (K):

$$SENX_{I,K,J} = \left[\frac{SENX_{I,K,J1} - SENX_{I,K,JJ}}{PSIF_{L2} - PSIF_{L1}}\right] [PSCF_{ICC} - PSIF_{L1}] + SENX_{I,K,JJ} \qquad \text{PNdB or dBA}$$

where

$SENX_{I,K,J}$ = the final profile data in PNdB or dBA for the Ith angle, Kth distance and measure index J (J ranges from 9 to 12).

$SENX_{I,K,J1}$ = the profile data for the J1th measure index from the second (L2) reference dataset for I and K.

$SENX_{I,K,JJ}$ = the profile data for the JJth measure index from the first (L1) reference dataset for I and K.

$PSIF_{L2}$ = power setting from the second (L2) reference dataset.

$PSIF_{L1}$ = power setting from the first (L1) reference dataset.

$PSCF_{ICC}$ = the output profile power setting for which the profile data are interpolated.

Edit and Write Profile Data

When flag IEDIT is zero, subroutine EDIT is called to select the ten angles which best describe each profile measure at the reference distance. The ten selected angles are angles 0 and 180 degrees plus the eight angles from 10 to 170 degrees for which the value of array $NR_{I,J}$ is greater than nine, where I is the angle index (I=1 to 17) and J is the measure index (J=1 to 3 for PNLTX, ALX and ALTX).

Subroutine PPFDAT is called to write the final profile data for the requested measures (MEAS>0) on file TAPE2 and to print the profile data tab output. The quantity of data written on TAPE2 depends on the value of the IEDIT flag:

(1) For IEDIT<0, all TAPE 2 output are omitted.

(2) For IEDIT=0, write the 10 angles selected by subroutine EDIT.

(3) For IEDIT=1, write all 19 angles of profile data.

A description of the content and format of these profile datasets is given in Appendix H.

The profile data listings are printed when program flag IPR is greater than zero. They contain data for all 19 angles and 22 distances; one page is printed for each measure (listing includes the PNLX data when PNLTX is computed).

Subroutine PLT prints (IPR>0) a plot of PNLTX, ALX and ALTX noise level versus angle for the reference distance. This plot is very helpful when selecting the ten angles (manually) or when checking the angles selected by the edit routine. The angles written on TAPE2 for each measure are printed below this plot.

At this point, control is returned to label 10 to begin the next aircraft analysis.

SUBROUTINE TESTN(NPM)

This subroutine is called from the MAIN routine to input the aircraft code sheet parameters. The subroutine also initializes numerous test variables and sets code sheet default parameters. There should be sufficient comment statements in the listing to document most of the coding.

Method

The first segment of the subroutine (to label 10) reads the code sheet test parameters and sets the program default values. The computer job is terminated when an end of file is read from unit 5. The code sheet parameters and default conditions are described in Appendix B. The reference temperature (IT8) is converted from °F to °C as required to compute the impedance data.

The impedance ratio for reference and profile output conditions is:

$$FIMPR8 = \left[\frac{273 + TM}{273 + TM8}\right]^{1/2} \left[\frac{P8}{P1}\right]$$

where

TM = reference temperature (15°C)

TM8 = profile output temperature in °C

P1 = reference barometric pressure (29.92 in Hg).

P8 = profile output barometric pressure in inches Hg.

Subroutine ALPH is called to compute the atmospheric absorption data in dB per 1000 feet for non-standard day profile conditions (ATN8). For standard day conditions (59°F and 70%), these absorption data are stored in the ATN data statement array.

SUBROUTINE ALPH(REL,TEMP,ABC,IL,IH)

This subroutine is called from subroutine TESTN to compute the octave or 1/3 octave band atmospheric absorption data in dB per 1000 feet for non-standard day temperature and relative humidity. This subroutine is the same as subroutine ALPH in the OMEGA 10 program.

FUNCTION ATKN(X,Y,N,K,XI)

This function is a general AITKEN interpolation function, used by subroutine ALPH to compute the normalized molecular absorption coefficient. ATKN was obtained from the ASD computer center library (old IBM 7094 library). Since this is a common interpolation function defined in most numerical methods texts, no additional description will be given.

SUBROUTINE HEADS(IPH)

This subroutine is called from the MAIN routine and from subroutines CDIST and PLT to print page header blocks at the top of all output pages. The header blocks are 112 characters wide for the reference sound pressure level output (label 2000 formats) and 126 characters wide for all profile output pages (label 3000 formats). The IPH subroutine argument determines the specific page header block printed for each call.

The content and format of the header blocks can best be observed by consulting the sample problem in Appendix D. This subroutine should contain sufficient comment statements to identify the data being printed. It may also be helpful to consult the subroutine HEAD documentation in the OMEGA 10 program; the five categories of data described there also apply here.

SUBROUTINE RSPLN(NN,IERR)

This subroutine is called from the MAIN routine to input one reference dataset from file TAPE7 (unit 7) for each normal operation power code (OPC) in the reference file (NOISEFILE 4) for aircraft ACC. When file TAPE7 contains more than one reference dataset for one or more OPC's, only the last dataset is stored by this routine. The special case operation power code data (Afterburner, Wet or With Jets) are read only when at least one special case was requested on the code sheet (IFCC>0). The special case operation power codes are stored in array OPCSP which must be updated when new codes are added to the NOISEFILE database. NN is the maximum number of datasets for which storage has been allocated in the program (NN=6). The IERR argument is a program error flag which returns codes of 1 to 4 for different type input errors.

The flowchart in Figure 8 and the comment statements in the listing should make it easy to follow the data being read; the format and content of these ground run-up reference datasets are also given in Appendix G.

FUNCTION ICV(R)

This function is used in the MAIN and PLT routines to convert variable R to an integer. R is rounded up when the fractional part is greater than or equal to 0.5.

SUBROUTINE CDIST(IRD,D1,II)

This subroutine is called from the MAIN routine to compute the single event noise profile data (e.g., PNLTX versus distance for 22 distances from 200 to 25,000 feet) from the reference SPL spectra stored in array FSPL.

The subroutine argument IRD is the index of the standard distance which is within one percent of the reference distance. IRD is defined in this subroutine and returned to the MAIN routine. For the present standard references distance DIST of 250 feet, IRD will always be two. D1 is a constant computed in the MAIN routine

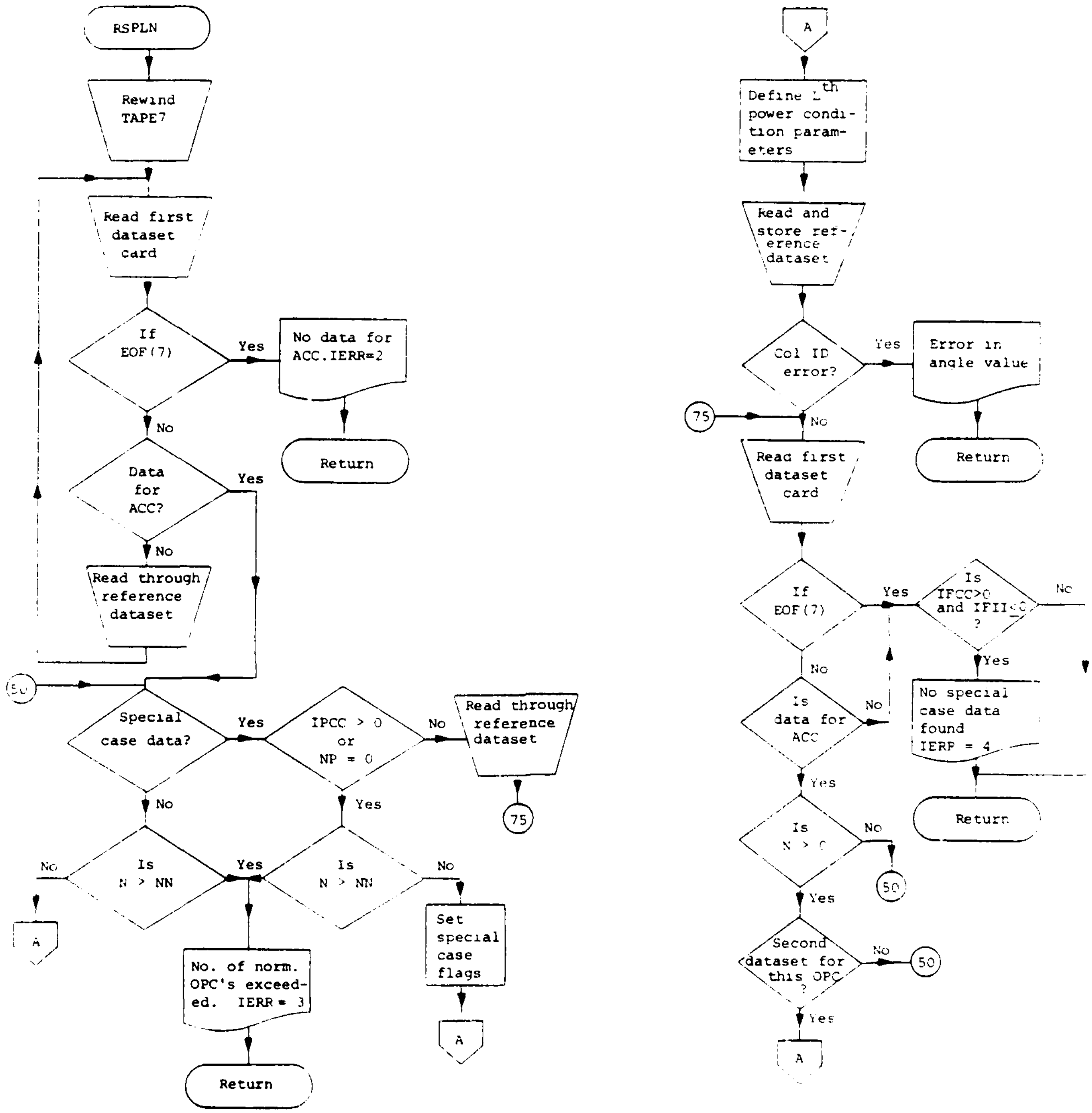
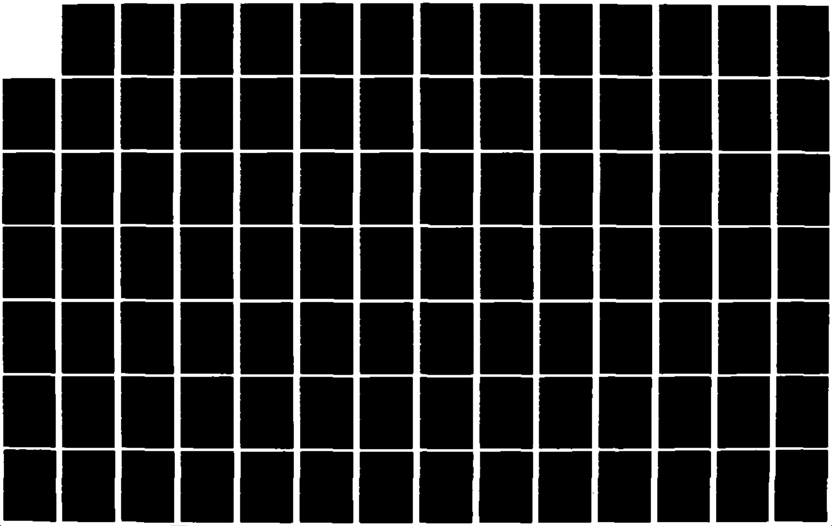
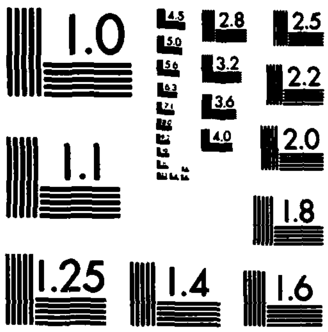


Figure 8. Flowchart for Subroutine RSPLN.

AD-A127 419 COMPUTER PROGRAMS FOR PRODUCING SINGLE-EVENT AIRCRAFT NOISE DATA FOR SPEC..(U) DAYTON UNIV OH RESEARCH INST H T MOHLMAN APR 83 UDR-TR-82-30 AFAMRL-TR-83-020 2/5

UNCLASSIFIED F33615-78-C-0500 F/G 9/2 NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

and defined in the next section. II is a power setting related index (see MAIN routine).

The EA data statement array contains the excess attenuation data for frequencies 50 Hz to 800 Hz and distances 400 to 6300 feet. These data were obtained from Figure 3 which was taken from AMRL-TR-75-50.[3]

Extrapolated SPL Data

The first segment of this subroutine (statement label 135 loop) computes the SPL spectrum extrapolated to the Kth standard profile distance:

$$SPLX_{I,J} = FSPL_{I,J,L} + D1 - EAD - \frac{(SX_K)\ (ATN8_J)}{1000}$$

$$- 20 \log (SX_K) + \frac{(DIST)\ (ATNC_J)}{1000} \qquad \text{dB}$$

where

$SPLX_{I,J}$ = the calculated band SPL in dB at the Kth profile distance from the source for angle index I and frequency index J.

$FSPL_{I,J,L}$ = reference band SPL in dB at distance DIST and for angle index I, band index J, and power setting index L.

D1 = defined in the MAIN routine
= 10 log (FIMPR8) + 20 log (DIST)

FIMPR8 = the ratio of profile and reference characteristic impedance (see subroutine TESTN).

DIST = reference distance in feet from the source (250 feet).

EAD = excess atmospheric attenuation of sound in dB over distance SX_K for frequency band index J (not defined for all J or for all SX_K).

SX_K = the Kth standard profile distance in feet (defined in the MAIN).

$ATN8_J$ = sound absorption coefficient in dB per 1000 feet for frequency index J and profile output temperature and relative humidity.

$ATNC_J$ = same as above except for standard day conditions (reference).

Frequency Weighted Measures

The statement label 250 loop controls the computation of the perceived noise level (PNLX), A-weighted overall sound level (ALX) and tone correction (CXD---reference distance only) for each spectrum (angle) for the Kth profile distance and IIth power setting. These data are computed only when requested by the MEAS program flag. Subroutine CPNL is called to compute the PNLX data for the Ith spectrum. If PNLX data are missing beyond the second distance, PNLX is extrapolated linearly from the last two good points:

$$PNLX_{I,K,II} = (2)\ (PNLX_{I,K-1,II}) - PNLX_{I,K-2,II} \qquad \text{PNdB}$$

The A-weighted overall sound level for the Ith spectrum are computed by subroutine CAL. These ALX data are the final A-weighted profile data. The tone correction data are computed for the Ith spectrum and reference distance (IRD) by subroutine CPTC.

Single Event Profile Data

The PNLTX and ALTX profile data are computed by adding a smoothed tone correction to the PNLX and ALX data (label 400 loop):

$$PNLTX_{I,K,II} = PNLX_{I,K,II} + (C1)\ (CXD_I) \qquad \text{PNdB}$$

$$ALTX_{I,K,II} = ALX_{I,K,II} + (C1)\ (CXD_I) \qquad \text{dBA}$$

where

CXD_I = the tone correction in dB for the Ith spectrum at the reference distance.

C1 = 1.0 for distances 200 to 3150 feet.
= (0.2)(18-K) for distances 4000 to 8000 feet (K=14 to 17).
= 0.0 for distances 10000 to 25000 feet.

SUBROUTINE CPNL(FJ,I,II)

This subroutine is called from subroutine CDIST to compute the perceived noise level (PNLX) for the Ith spectrum (angle), Kth distance and IIth power setting. Function FNOY is used to compute the noy data for each SPL data point. Subroutine argument FJ is 0.15 for this 1/3 octave band data. The PNLX algorithms applied in this subroutine are the same as applied in subroutine CPNL in the OMEGA 10 program; thus no additional documentation will be given here.

FUNCTION FNOY(SPL,JJ)

This function is used in subroutine CPNL. It is the same as function FNOY described in the OMEGA 10 program documentation.

SUBROUTINE CPTC(PTC,I)

This subroutine is called from subroutine CDIST to compute the tone correction (PTC) for the Ith spectrum (angle) and the reference distance. This subroutine is the same as subroutine CPTC described in the OMEGA 10 program documentation.

SUBROUTINE CAL(I,II)

This subroutine is called from subroutine CDIST to compute the A-weighted overall sound level (ALX) for the Ith spectrum the Kth distance, and IIth power setting. The ALX algorithm is the same as described for subroutine CAL in the OMEGA 10 documentation. Many of the variable names are different in this subroutine; however, they should be defined in sufficient detail in comment statements in the listing.

SUBROUTINE PPFDAT(JL,J2,JI,L1,L2,IPR,IEDIT)

This subroutine is called from the MAIN routine to write (IEDIT>-1) the PNLTX, ALX, and/or ALTX single event profile data on file TAPE2 (unit 2) and to print (IPR>0) the PNLX, PNLTX, ALX and/or ALTX tab output on the OUTPUT file. For both types of output, only measures requested by the MEAS flag are printed. To simplify the coding and reduce the number of write statements, these profile data are stored in the blank common array SENX.

The subroutine arguments are defined as follows:

(1) J1 and J2 are the first and last indices of the SENX profile data and JI is the increment of J1 to J2.

(2) L1 and L2 are the indices of the normalized data used to compute (interpolate) the profile data for the requested power condition.

(3) IPR is the program tab print flag.

(4) IEDIT is the profile flag which controls the quantity of data printed on TAPE2.

<u>Write Profile Datasets on TAPE2</u>

The number of angles of profile data written on TAPE2 by the label 100 loop depends on the value of the IEDIT program flag. All 19 angles or the 10 angles selected by the EDIT routine are written for IEDIT equal to one and zero, respectively. A complete description of the content and format of the 10 angle ground run-up profile datasets is given in Appendix H. When all angles are written, the final 10 angles which most accurately describe each noise profile must be selected from these 19 angles. The tab plot of the profile data for the reference distance, printed by subroutine PLT on output page J, is included to aid in the selection of these 10 angles.

<u>Print Single Event Data</u>

The remainder of this subroutine (label 400 loop) prints the four single event measures (PNLX, PNLTX, ALX, and ALTX) on pages D through G, respectively. These data are printed from the SENX array using the J1, J2, and JI subroutine arguments defined above.

Subroutine HEADS is called to print each page header block. All single event data less than zero are blanked out in the printout. The content and format of these pages can best be observed by consulting the sample problem in Appendix D.

SUBROUTINE TITPG

This subroutine is called from the MAIN routine to print the cover or title page for each test. This cover page provides the following information:

(1) The aircraft name and code from which the data were measured.

(2) The program used in the test analysis.

(3) The date of the computer run.

(4) The types of data computed and printed for the test.

The content and format of this title page can best be understood by consulting the sample problem in Appendix D. With this sample problem title page as a guide, there should be no problem in following the coding.

SUBROUTINE PLT(IRD,JJ1,JJ2,JJI)

This subroutine is called from the MAIN routine to print a plot of PNLTX, ALX, and ALTX versus angle. These data are for the reference distance (IRD = 250 feet) from the profile datasets. The content and format of this plot can best be understood by consulting page J in the sample problem in Appendix D. This plot simplifies the selection or checking of the 10 angles which most accurately describe the profile data.

The JJ1, JJ2 and JJI subroutine arguments are the indices and the index increment of these profile measures in array SENX. IRD is the index of the reference distance in array SENX.

Method

The first segment of this subroutine initializes the P plot array, calls subroutine HEADS to print the page header block, and prints the plot symbol identification line, the top border line and

the first grid line below the header block. The label 25 loop determines the maximum PNLTX value which is then used to set up the abscissa scale values. The maximum annotated scale value is the first multiple of ten greater than this maximum PNLTX. The minimum value is 100 less than the maximum. The actual minimum and maximum values are two less and two greater than these annotated scale values.

The label 200 loop sets up and prints the plot for each of the 19 angles. The ordinate annotation and title and grid pattern are determined from the angle index I. The label 120 loop scales the PNLTX, ALX and ALTX data for the I^{th} angle and sets up the corresponding symbol in the plot array. The data are then printed and the plot array is reinitialized with the data stored in array SAV. There should be sufficient comments in the coding to follow the setup and printing of the data.

SUBROUTINE RANK(IREQ,IERR)

This subroutine is called from the MAIN routine to determine the reference data (one or two datasets) required to compute the profile output for each requested output power setting (PSC or PSCF). The indices of these reference data are stored in array IREQ for each power setting. Subroutine argument IERR is a program error flag which is returned greater than zero when errors occurred in this subroutine.

<u>Method</u>

The DECODE function is used to convert the input (PS) and output (PSC) power setting data from character format to floating point. The floating point data are required for ranking and interpolating the data.

Next this subroutine ranks all normal reference file power setting data (PSIF) and all normal requested output power setting data (PSCF). The special case data which may not be interpolated (Afterburner, Wet and With Jets) are not ranked. These ranked power setting data are then used to determine which reference data are

required to interpolate profile data for each (IC) output power setting. Indices of these reference data are defined in array IREQ for each output power setting. If profile data for the same reference power setting are required to interpolate profile data for two or more consecutive output power settings, the index of this reference power setting is stored in consecutive columns in the same row in array IREQ.

Profile data at these reference power settings are later extrapolated from the reference SPL spectra (see MAIN routine) as requested in array IREQ; thus, only those profile reference data required to interpolate data at the profile output power settings are extrapolated by the program. Also, to conserve storage, reference profile data storage is limited to the two power settings required to compute each output profile power setting; however, IREQ is checked to avoid duplicate reference profile computations.

There should be sufficient comments in the coding to follow the setup of the IREQ index array.

SUBROUTINE SUMRY(IREQ,IEDIT,FMXER)

This subroutine is called from the MAIN routine to print the OMEGA 11 summary page which lists job identification parameters as well as a summary of the input and output data. This page is the only tab output when the program print flag, IPR, is less than one. The subroutine arguments are defined as follows:

(1) IREQ is an array containing the indices of the reference datasets used to interpolate the profile data.

(2) IEDIT is a program flag which controls the editing of the profile data.

(3) FMXER is the maximum error permitted in the EDIT subroutine.

If the sample problem summary page is used as a guide, the coding in this subroutine should be easy to follow.

SUBROUTINE EDIT(IRD,J1,J2,JI,ACC,PSC,PSU,FMXER)

This subroutine is called from the MAIN routine to select the ten angles for each measure (PNLTX, ALX and ALTX) which best define the angle versus noise level data for that measure at the reference distance (250 feet). Actually only eight angles are selected by this routine, since angles 0 and 180 degrees are always included. Reference distance profile data for all three measures at all 19 angles are used to compute the three sets of ten angles, even though only one or two of the measures are required for the data analysis (see MEAS program flag).

The subroutine arguments are defined as follows:

(1) IRD is the index of the reference distance.

(2) J1 and J2 are the indices of the PNLTX and ALTX data in array SENXD and JI is the index increment (ALX data is in index J1 + JI).

(3) ACC is aircraft code, PSC is the power setting for which the data are being computed, and PSU are the power setting units.

(4) FMXER is the maximum error permitted in this EDIT routine (default FMXER=5.0).

Method

The following outline describes the method used to obtain the best set of ten angles:

(1) Compute the 18 angle to angle changes in PNdB or dBA for each measure (slopes) and store in array SL.

(2) Compute the 17 changes in slope (DSL) for each measure and assign to angles 10, 20, ..., 170 degrees. Store these data in array DSL.

(3) Rank the absolute values of these 17 changes in slope (DSL) for each measure (label 50 loop).

(4) The eight angles with the largest rank (ie. largest change in slope; rank 10 to 17) plus angles 0° and 180° will be the initial guess for the desired 10 angles for each measure. There are three sets of 10 angles, one for each measure. The rank data are stored in array NR.

(5) Using the selected 10 angles and linear interpolation, compute the difference between the original and interpolated data for each angle; ie., compute the error. The error for the 10 selected angles will always be zero; thus, the RMS of the error is computed only for the 9 remaining angles:

$$RMS = \frac{\Sigma(ERROR)^2}{9} .$$

These error data are computed by subroutine ERR.

(6) Compute the error and RMS error described in step 5 above for each measure three times using the three sets of angles (step 4) for each measure. For example, for PNLTX compute the RMS of the error using the angles selected for PNLTX, ALX and ALTX. For each measure, save the angles, error data and RMS for the smallest RMS error (see statement label 150 and 200 loops).

(7) Determine the angle with the largest error using the error data in step 6 above (for one measure at a time). If this error is greater than ERMAX (ERMAX=1.49 dB), select this angle as one of the eight to be chosen and, one at a time, delete each of the eight angles previously selected computing the error and RMS error for each of the eight sets. Determine the best of the eight RMS values and, if better than the RMS in step 6 above, revise the angle set for this measure. If no improvement is found, repeat the above using the second largest error greater than ERMAX. This step is performed by subroutine ITER called from this routine.

(8) Repeat step 7 above a maximum of five times (in subroutine ITER) or until all error are less than ERMAX (maximum of five passes including the second, third etc., largest error passes).

(9) Repeat steps 7 and 8 above for each of the three measures (label 200 loop).

(10) At this point we have revised sets of angles (compared with step 6 above) for a measure only if one or more errors were greater than ERMAX for that measure. If any angle sets have been revised, repeat steps 6 through 9 above using the new angle sets instead of those from step 4; otherwise, use angle sets selected

in step 6 as final values for each measure. The repeat of steps 6 through 9 are computed by the statement label 220 and 230 loops which also use subroutines ERR and ITER.

(11) Return the angle set for each requested measure to the MAIN routine in array NR. The angle set consists of those angles whose rank is from 10 to 17 in array NR. Print error messages if the interpolation errors using these final selected angles exceed FMXER (default FMXER=5.0).

SUBROUTINE ERR(J,JA,NRA,RMSA,ERA,JM)

This subroutine is called from subroutines EDIT and ITER to compute the error data as described in step 5 in subroutine EDIT. The subroutine arguments are:

(1) J is the measure index of the original data.

(2) JA is the measure index in the rank (NRA), error (ERA) and RMS error (RMSA) arrays. JA indicates the angle set being used to interpolate the above J measure data.

(3) NRA, ERA and RMSA are defined in (2) above.

(4) JM is the variable dimension of arrays NRA, ERA and RMSA.

Method

Subroutine FINTP is called to linearly interpolate the PNdB or dBA levels of the nine angles with rank less than ten. The error data are then computed as follows:

$$ERA_{I,JA} = SENX_{I,J} - DBC_I$$

$$RMSA_{JA} = [\frac{1}{9} \sum_I (ERA_{I,JA})^2]^{1/2}$$

where

$ERA_{I,JA}$ = the interpolation error in PNdB or dBA for the I^{th} angle and measure index JA.

$SENX_{I,J}$ = the computed measure data in PNdB or dBA for angle I and measure J.

DBC_I = the interpolated measure value in PNdB or dBA for angle I.

$RMSA_{JA}$ = the RMS error for measure index JA.

The above error data ($ERA_{I,JA}$) are zero for the eight angles with rank greater than nine; thus the RMS error are computed by dividing the sum of the error data by nine.

SUBROUTINE FINTP(AG,DBC,X,Y)

This is a linear interpolation subroutine called by subroutine ERR to interpolate the measure data for angles with rank less than ten. Arrays X and Y contain the angle and corresponding noise level data (PNdB or dBA) for angles 0 and 180 degrees plus the eight angles with rank greater than nine. Array AG contains the 19 angle values in ten degree increments from 0 to 180 degrees. Array DBC contains the noise level computed by this subroutine for the 19 angles.

Method

For angles defined in array X (rank greater than 9), DBC_J is set equal to the given noise level:

$$DBC_J = Y_L \qquad \text{PNdB or dBA}$$

where

DBC_J = noise level for the J^{th} angle.

Y_L = the given noise level corresponding to angle X_L which is the same as angle AG_J.

For angles which must be interpolated the linear interpolation function is:

$$DBC_J = Y_{L1} + (Y_L - Y_{L1}) \left(\frac{XI - X_{L1}}{X_L - X_{L1}}\right) \qquad \text{PNdB or dBA}$$

where

DBC_J = the interpolated noise level for the J^{th} angle.

XI = angle AG_J.

L = the index of the first angle in array X greater than XI.

L1 = L - 1.

X_L = first angle greater than XI.

X_{L1} = first angle less than XI.

Y_L = given noise level corresponding to angle X_L.

Y_{L1} = given noise level corresponding to angle X_{L1}.

SUBROUTINE ITER(J,JMN,ICK,ERMAX,NRD)

This subroutine is called from subroutine EDIT to perform the interations described in steps 7 and 8 in subroutine EDIT. The subroutine arguments are:

(1) J is the index of the original measure data and of the rank (NRD) and RMS error (RMS) data.

(2) JMN is the index of the minimum error set in array ER.

(3) ICK is an error flag which is one when an error greater than ERMAX was found in this routine. This usually results in a change in rank (angles selected).

(4) ERMAX is a dB level defined in subroutine EDIT. An attempt is made to improve the angle selection for interpolation errors greater than or equal to this level.

(5) NRD is a dummy rank array.

APPENDIX A

OMEGA 10 CODE SHEETS AND SETUP PROCEDURE

This Appendix contains the standard procedure for setup and execution of the OMEGA 10 program which includes the OMEGA 10 program code sheets and a detailed description of each code sheet parameter and alphanumeric data field.

OMEGA 10 PROGRAM CODE SHEET

I. JOB CONTROL CARD (One Per Job):

Col. 1 _ _ b _ _ _ b _ _ DATE; eg 29 JUN 77
11 _ _ _ _ _ _ DATN; Data in DAMOYR form, eg. 290677
18 ___ IPR [0-- no print]
20 ___ MEAS(1) EPNL [0 for IPR=0; 1 for IPR=1]
22 ___ MEAS(2) SELT [0 for IPR=0; 1 for IPR=1]
24 ___ MEAS(3) SEL [1 for IPR=0; 1 for IPR=1]
26 ___ IPU [1 for IPR=0; 0 for IPR=1]

II. OUTPUT PARAMETERS FOR EACH AIRCRAFT (2 or 3 Cards):

Card #1

Col. 1 _ _ _ ACC
4 _ _ _ ITEMP [59°F]
7 _ _ _ IRHUM [70%]
11 _____ PV [w]
13 _____ CRI [0]
15 _ _ _ _ _ DELN [0.0]
20 _ _ NP
22 _ _ _ _ _ _ PSU (left justify)

Card #2 (Profile Output Power Data)

Col. 1 _ _ _ _ _ PSC #1	Col. 6 _ _ _ VX	Col. 9 _ _ OPCR	Col. 11 _ _ OPCC [81]
13 _ _ _ _ _ PSC #2	18 _ _ _ VX	21 _ _ OPCR	23 _ _ OPCC [82]
25 _ _ _ _ _ PSC #3	30 _ _ _ VX	33 _ _ OPCR	35 _ _ OPCC [83]
37 _ _ _ _ _ PSC #4	42 _ _ _ VX	45 _ _ OPCR	47 _ _ OPCC [84]
49 _ _ _ _ _ PSC #5	54 _ _ _ VX	57 _ _ OPCR	59 _ _ OPCC [85]
61 _ _ _ _ _ PSC #6	66 _ _ _ VX	69 _ _ OPCR	71 _ _ OPCC [86]

Card #3 (Profile Output Power Data Conti.; required only when NP>6)

Col. 1 _ _ _ _ _ PSC #7	Col. 6 _ _ _ VX	Col. 9 _ _ OPCR	Col. 11 _ _ OPCC [87]
13 _ _ _ _ _ PSC #8	18 _ _ _ VX	21 _ _ OPCR	23 _ _ OPCC [88]
25 _ _ _ _ _ PSC #9	30 _ _ _ VX	33 _ _ OPCR	35 _ _ OPCC [89]
37 _ _ _ _ _ PSC #10	42 _ _ _ VX	45 _ _ OPCR	47 _ _ OPCC [90]
49 _ _ _ _ _ PSC #11	54 _ _ _ VX	57 _ _ OPCR	59 _ _ OPCC [91]
61 _ _ _ _ _ PSC #12	66 _ _ _ VX	69 _ _ OPCR	71 _ _ OPCC [92]

(Right Justify "PSC" Data)

III. TERMINATE SETUP DECK WITH AN "END OF RECORD" OR "END OF JOB" CARD

---

(1) Repeat section II for each aircraft set in the job.
(2) [ ] -- Program default values for the above parameters.
(3) See Standard Procedure for Setup and Execution of the OMEGA 10 Program for above parameter definitions.

STANDARD PROCEDURE FOR SETUP AND EXECUTION OF THE OMEGA 10 PROGRAM

1) The OMEGA 10 setup deck must contain the following:

   (a) One job control card:

   (b) One, two or three output parameter cards for each set of profile data for each aircraft.

   The parameters required for each card are listed on the OMEGA 10 code sheet and described in detail in Steps 2 and 3 below.

2) Fill in the OMEGA 10 code sheet job control card parameters were default conditions do not apply (code sheet Item I). The required parameters are defined as follows:

   (a) The DATE in columns 1 to 9 will be printed on all output pages and in the first comment line in each profile data-set (9 alphanumeric characters).

   (b) The date in the day, month, year form (DATN) in columns 11 to 16 is printed as part of the run identification on all the plot pages (G, J, K, N, and O). It is not used in the no-print mode and thus may be left blank on the code sheet.

   (c) The value of IPR (integer) sets the print (IPR=1) or no-print (IPR=0 or blank) mode of the OMEGA 10 job. In the no print mode (default), only error messages and the summary page are printed on the OUTPUT file (TAPE6) and only the measure requested on the code sheet is computed. In the print mode, all seven measures are computed and all output are printed on the OUTPUT file.

   (d) The MEAS(1), MEAS(2) and MEAS(3) parameters (integers) determine which noise measures (EPNL, SELT and SEL respectively) are computed by the program. In the print mode (IPR=1), all three are always set equal to one by the program because all three measures are required; thus they may be left blank on the code sheet. In the no-print mode (IPR=0 or blank), measure data will be computed only for the one MEAS parameter which is greater than zero (default is MEAS(3)=1 and SEL is computed). Note that the PNL, PNLT, AL and ALT noise measures are always computed and printed in the print mode; however they cannot be written to file TAPE3.

(e) IPU (integer) controls the printing of the profile datasets on file TAPE3 which may be equivalenced or copied to the PUNCH file. For IPU equal blank or zero (default for IPR=1), no data are written on TAPE3. For IPU equal to one (default for IPR=0 or blank), all profile data are written on TAPE3.

3) Fill in the OMEGA 10 code sheet output parameters for each aircraft where default parameters do not apply (code sheet Item II). One, two, or three cards are required for each aircraft set depending on the value of NP defined below. The required parameters are defined as follows:

(a) ACC must be a three character numeric aircraft code. ACC is part of the profile dataset COMDECK name and part of the output profile identification required by the NOISEMAP program. It is also used to search the reference file for the required reference data.

(b) ITEMP and IRHUM (integers) are the output temperature (°F) and relative humidity (%), respectively. The default values listed on the code sheet are for standard day conditions.

(c) PV is an alphanumeric profile version code (usually alpha) which is printed on all output and is the second last character in the profile COMDECK name. One function of PV would be to make COMDECK names unique when the same aircraft data are run for different weather conditions (NOISEMAP does not read the PV code).

(d) CRI is an alphanumeric COMDECK revision identifier (usually integer) which is printed on the summary page and is the last character in the profile COMDECK name. CRI is designed to make COMDECK names unique when several revisions of the same data are stored in the NOISEFILE 3 and 4 data bases. The CRI default value will normally apply (not read by the NOISEMAP program).

(e) DELN (or "DELTA N) is the dB level to be added to all reference data for this aircraft (floating point or right justified integer). It is printed on the summary profile data pages and is typically used to adjust data for multiple engines.

(f) NP is the number of power settings (PSC's) to be computed for this ACC. If NP is zero or blank, profile data are computed for all operation power codes (for ACC) in the reference file with the reference file airspeed and power settings; also the output operation power codes (OPCC) are the same as the operation power codes in the reference file (that is, for NP=0, cards two and three are not read by the program). NP must be an integer less than or equal to 12.

(g) PSU is the power setting unit which applies to the PSC data. PSU is also used to select the reference file power setting data; thus it must exactly match (including blanks) one of the units in the reference file or the ACC data will be terminated. PSU must be left justified in the 6 character field (alphanumeric). For the NP=0 option, the PSU field may be left blank in which case the first power setting data will be carried with the profile data.

(h) The PSC's are the power setting values for which profile data are computed. The PSC data may be listed as integer or floating point in any desired sequence, but in either case must be right justified in the five character field. Note that each reference dataset contains the source power setting in one, two, or three different units in the third comment card. The PSU parameter described in item 3g above specifies which of these power settings the OMEGA 10 program will use to interpolate the profile data. The PSC's are printed in the third comment card in each profile dataset, on all profile output pages, and on the summary page.

(i) The VX's are the airspeed values (right justified integers) in knots to which the profile data are adjusted. They are printed in the first comment line in each profile dataset, on all profile data output pages, and on the final summary page.

(j) The OPCR's (numeric with leading zero) are reference file operation power codes which determine the operation power descriptions of the profile data and the reference points (SEL, SELT, or EPNL versus power setting) from which the measure data for the PSC power settings are interpolated or extrapolated (the slope line passes through this reference point). The COMDECK names of the reference file datasets for this reference point and for the two slope points are printed on the summary page.

(k) The OPCC's are two character numeric operation power codes assigned to the output profile data. The OPCC are part or the COMDECK name and are also part of the profile identification used by the NOISEMAP program. Default values are 81 to 92. For NP equal to zero, the OPCC's are set equal to be reference file OPC's.

4) The following comments apply to the PSC, VX and OPCR data:

(a) For OPCR equal to 01, 02, 08, 09, 10, 17, 18 or 19, the PSC power setting must be the same as the reference file power setting or the PSC data will be deleted from the run; that is, no extrapolation or interpolation is permitted for these OPCR's. For OPCR equal to 17, 18 or 19, the VX airspeed must also be the same as the reference file airspeed.

(b) For OPCR equal to 15 or 16 and PSC not equal to the reference file power setting, both OPC's 15 and 16 must be in the reference file.

(c) When the PSC power setting is the same as the reference file power setting designated by OPCR, then only the OPCR reference file data are required to compute the PSC profile data. For all other cases where PSC is not the same, at least one additional reference file dataset is required to apply the Δ"6 rules. It is assumed here that the individual completing the code sheet is familiar with the Δ"6 rules or at least the Δ"6 requirements and limitations.

(d) If new operation power codes are added to the reference file, the OMEGA 10 program must be modified to apply the Δ"6 rules to the new OPC's.

5) Repeat Step 3 above for each set of profile data for each aircraft in the job. If two or more sets of profile data are required for the same aircraft because of additional PSC's or different DELN or weather data, the program uses the reference data read for the previous set and thus avoids searching the reference file for the same data. Since NOISEMAP uses an ID composed of the ACC and OPCC codes, computer jobs run for NOISEMAP input can not use the default OPCC for multiple sets for the same ACC; however, for jobs unrelated to NOISEMAP, PV or CRI codes can be used to make the COMDECK names unique.

6) The program will read the reference data from file "TAPE7" (or unit 7). These data must be on disk, tape or cards in card image format; not in the NOISEFILE 4 CDC UPDATE format. The program rewinds the TAPE7 file before searching for the aircraft (ACC) data; thus, aircraft sequence is not important in the OMEGA 10 job or on file TAPE7 (all data for each aircraft must be back to back in TAPE7). The program reads and stores all reference data for all operation power codes (MAX of 6) available on TAPE7 for aircraft ACC. If TAPE7 contains more than six operation power codes for aircraft ACC, a warning message is printed and only the first six are read and stored by the program.

7) Execution of the OMEGA 10 program requries a CM of 54000_8. The files are setup as follows:

OMEGA10(INPUT,OUTPUT,TAPE5=INPUT,TAPE6=OUTPUT,TAPE7,TAPE3)

where TAPE7 is the reference file and TAPE3 is the profile dataset output file.

8) After execution of the computer job, the following data are available:

(a) The summary pages and all other tab printout are on the OUTPUT file or any file equivalenced to the OUTPUT file at execution time.

(b) The profile data are on file "TAPE3" which may be punched, copied onto tape or cataloged as a permanent disk file. It may be desirable to rewind the TAPE3 file and do a COPYSBF onto the OUTPUT file to obtain a listing of the profile data.

9) Data for aircraft code ACC will be deleted from the computer job and an error message printed when one or more of the following problems occur:

(a) The PSU from the code sheet doesn't match the first power setting units for ACC in the reference file.

(b) There is an error in the operation power code, aircraft code, or card seqeunce in one or more reference file data cards.

(c) The reference file minimum slant range is not within 1% of a standard profile distance.

(d) No reference data were found for this aircraft in the reference file.

10) Data for operation power code OPCC will be deleted from the aircraft set and an error message printed when one or more of the following occur:

(a) There is insufficient data for extrapolation or interpolation to the PSC power setting.

(b) The reference file and the PSC power settings are not equal as required for this OPCR.

(c) The reference file and the VX airspeeds are not the same as required for this OPCR.

(d) The reference operation power code (OPCR) was not found in the reference file.

11) Warning messages are printed when one or more of the following occur:

(a) The reference file contains more than six datasets; only the first six are read for this aircraft.

(b) The reference file minimum slant range is not equal to 1000 feet as assumed by the program in subroutines DELTA6 and PPFDAT.

(c) The PSC for NORMAL RATED THRUST (OPCR=12) is less than the reference file APPROACH power setting.

12) The entire computer job is terminated when an "END of FILE" is read from the input file. This is the normal job termination.

APPENDIX B
OMEGA 11 CODE SHEETS AND SETUP PROCEDURE

This Appendix contains the standard procedure for setup and execution of the OMEGA 11 program which includes the OMEGA 11 program code sheets and a detailed description of each code sheet parameter and alphanumeric data field.

OMEGA 11 PROGRAM CODE SHEET

I. **JOB CONTROL CARD (One Per Job):**

```
COL.  1 __ __ b ___ ___ b ___ DATE; eg. 12 APR 77
     12 _____ IPR [0]
     13 ___ IEDIT [0]
     16 _____ MEAS(1)  PNLT [0]
     18 _____ MEAS(2)  AL   [0]
     20 _____ MEAS(3)  ALT  [0]
     21 _______ FMXER [5.0 dB]
```

II. **OUTPUT PARAMETERS FOR EACH AIRCRAFT (2 Cards):**

Card #1

```
COL.  1 _____ ACC
      8 _____ IT8 [59]
     11 ___ . ___ P8 [29.92]
     18 _____ IH8 [70]
     22 _____ PV [W]
     24 _____ CRI [0]
     26 _______ DELN [0.0]
```

Card #2 (Profile Output Power Data)

```
COL.  1 _____ NP
      2 _________ PSU (LEFT JUSTIFY)
     11 _______ PSC #1   COL. 17 ___ IFC   COL. 19 ___ OPCC[91]
     21 _______ PSC #2        27 ___ IFC        29 ___ OPCC[92]
     31 _______ PSC #3        37 ___ IFC        39 ___ OPCC[93]
     41 _______ PSC #4        47 ___ IFC        49 ___ OPCC[94]
     51 _______ PSC #5        57 ___ IFC        59 ___ OPCC[95]
     61 _______ PSC #6        67 ___ IFC        69 ___ OPCC[96]
```

(RIGHT JUSTIFY "PSC" DATA)

2nd AIRCRAFT

Card #1

```
COL.  1 _____ ACC
      8 _____ IT8 [59]
     11 ___ . ___ P8 [29.92]
     18 _____ IH8 [70]
     22 _____ PV [W]
     24 _____ CRI [0]
     26 _______ DELN [0.0]
```

Card #2

```
COL.  1 _____ NP
      2 _________ PSU (LEFT JUSTIFY)
     11 _______ PSC #1   COL. 17 ___ IFC   COL. 19 ___ OPCC[91]
     21 _______ PSC #2        27 ___ IFC        29 ___ OPCC[92]
     31 _______ PSC #3        37 ___ IFC        39 ___ OPCC[93]
     41 _______ PSC #4        47 ___ IFC        49 ___ OPCC[94]
     51 _______ PSC #5        57 ___ IFC        59 ___ OPCC[95]
     61 _______ PSC #6        67 ___ IFC        69 ___ OPCC[96]
```

(RIGHT JUSTIFY "PSC" DATA)

III. **TERMINATE SETUP DECK WITH AN "END OF RECORD" OR "END OF JOB" CARD**

(1) Repeat section II, cards 1 and 2 for each aircraft set in the job.
(2) [ ] -- Program default values for above parameters.
(3) See Standard Procedure for Setup and Execution of the OMEGA 11 Program for parameter definitions.

STANDARD PROCEDURE FOR SETUP AND EXECUTION OF THE OMEGA 11 PROGRAM

1) The OMEGA 11 setup deck must contain the following:

   (a) One job control card;

   (b) Two output parameter cards for each set of profile data for each aircraft.

   The parameters required for each card are listed on the OMEGA 11 code sheet and described in detail in Steps 2 and 3 below.

2) Fill in the OMEGA 11 code sheet job control card parameters where default conditions do not apply (code sheet Item I). The required parameters are defined as follows:

   (a) The DATE in columns 1 to 9 will be printed on all output pages and in the first comment line in each profile dataset (9 alphanumeric characters).

   (b) The value of IPR determines the quantity of tab printout on the OUTPUT file. If IPR is zero or blank, only the summary page and program error messages are printed for each aircraft. If IPR is greater than zero, all tab output are printed (IPR must be an integer).

   (c) The value of IEDIT determines the quantity of profile dataset output written of file TAPE2. If IEDIT is zero or blank, the profile datasets for each requested measure contain data for the 10 angles which best define the profile data (using linear interpolation) from 0° to 180°. If IEDIT is greater than zero, profile data for all 19 angles are written on TAPE2; for IEDIT less than zero, all profile data are omitted from TAPE2 (IEDIT must be an integer).

   (d) The MEAS(1), MEAS(2) and MEAS(3) parameters determine which noise measures (PNLT, AL and ALT respectively) are computed by the program. If all three are zero or blank, all measures are computed; otherwise, only measures corresponding to MEAS greater than zero are computed (all MEAS must be integer).

   (e) The value of FMXER is the maximum linear interpolation error permitted in the angle selection routine. For errors greater than FMXER, error messages are printed but the aircraft analyses are not terminated. Typically, the largest error in a relatively smooth profile is 1.0 to 1.5 dB or less. FMXER which applies only when IEDIT is zero or blank must be listed as a floating point number or right justified integer (default is 5.0 dB).

3) Fill in the OMEGA 11 code sheet output parameters for each aircraft where default parameters do not apply (code sheet Item II). The required parameters are defined as follows:

(a) ACC must be a three character numeric aircraft code. ACC is part of the profile dataset COMDECK name and part of the output profile identification required by the NOISEMAP program. It is also used to search the reference file for the required reference data (see Step 4 below regarding multiple sets for the same aircraft code).

(b) IT8, P8 and IH8 are the output temperature (°F), barometric pressure (in Hg) and relative humidity (%) respectively. The default values listed on the code sheet are for standard day conditions. IT8 and IH8 must be integers and P8 must be floating point.

(c) PV is an alphanumeric profile version code (usually alpha) which is printed on all tab output and is the second last character in the profile COMDECK name. One function of PV would be to make COMDECK names unique when the same aircraft data are run for different weather conditions (NOISEMAP does not read the PV code).

(d) CRI is an alphanumeric COMDECK revision identifier (usually integer) which is printed on the summary page and is the last character in the profile COMDECK name. CRI is designed to make COMDECK names unique when several revisions of the same data are stored in the NOISEFILE 3 and 4 databases. The CRI default value will normally apply (not read by the NOISEMAP program).

(e) DELN (or "DELTA N") is the dB level to be added to all reference data for this aircraft (floating point or right justified integer). It is printed on the summary and reference data pages and is typically used to adjust data for multiple engines.

(f) NP is the number of power settings (PSC's) to be computed for this ACC. If NP is zero or blank, profile data are computed for all operation power codes (for ACC) in the reference file; also the output operation power codes (OPCC) are the same as the operation power codes in the reference file (that is, for NP=0, card 2 columns 2 to 70 are not read by the program). NP must be an integer less than or equal to 6.

(g) PSU is the power setting unit which applies to the PSC data. PSU must exactly match (including blanks) the units in the reference file or the ACC data will be terminated. PSU must be left justified in the 6 character field (alphanumeric). Note that the program checks only the first power setting data in the reference file; thus only the first reference file power setting can be used to interpolate profile data.

(h) The PSC's are the power setting values for which profile data are computed. All PSC values must lie within the extremes available on the reference file. For uniformity, list special case PSC data (IFC=1) first followed by the normal PSC data (IFC=0); each in sequence from low to high (not required by the program). The PSC data may be listed as integer or floating point, but in either case must be right justified in the five character field. Note that each reference dataset contains the source power setting in one, two, or three different units in the third comment card; however, only the first power setting (value and units) is used for interpolation by the OMEGA 11 program.

(i) IFC is a program flag used to separate the AFTERBURNER, WET or WITH JETS special case data from the normal power data. IFC must be zero or blank for normal data and one (1) for special case data. For special case data (IFC=1), no interpolation is permitted and thus PSC must be exactly the same as the power setting in the normalized file.

(j) The OPCC are two character numeric operation power codes assigned to the output profile data. The OPCC are part of the COMDECK name and are also part of the profile identification used by the NOISEMAP program. Default values are 91 to 96.

4) Repeat Step 3 above for each set of profile data for each aircraft in the job. If two or more sets of profile data are required for the same aircraft because of additional PSC's or different DELN or weather data, ACC should be set equal to "***"; however, all other parameter must be defined or default conditions apply. When ACC=***, the program uses the reference data read for the previous set and thus avoids searching the reference file for the same data. Since NOISEMAP uses an ID composed of the ACC and OPCC codes, computer jobs run for NOISEMAP input can not use the default OPCC for multiple sets for the same ACC; however, for jobs unrelated to NOISEMAP, PV or CRI codes can be used to make the COMDECK names unique.

5) The program will read the reference data from file "TAPE7" (or unit 7). These data must be on disk, tape or cards in card image format; not in the NOISEFILE 4 CDC UPDATE format. The program rewinds the TAPE7 file before searching for the aircraft (ACC) data; thus, aircraft sequence is not important in the OMEGA 11 job or on file TAPE7 (all data for each aircraft

must be back to back in TAPE7). The program reads and stores all reference data for all operation power codes (MAX of 6) available on TAPE7 for aircraft ACC. If TAPE7 contains more than six operation power codes for aircraft ACC, all computations for that aircraft are terminated (one exception: if all IFC=0, special case data are not stored). The first Test number and Noise Source/Subject description read from the reference file (TAPE7) are the Test and Noise Source/Subject description used for this set of profile data for this aircraft. Run number is assigned from 01 to 06 in sequence of the PSC output.

6) After execution of the computer job, the following data are available:

   (a) The summary pages and all other computer printouts are on the OUTPUT file or any file equivalenced to the OUTPUT file at execution time.

   (b) The profile data are on file "TAPE2" which may be punched, copied onto tape or cataloged as a permanent disk file. It may be desirable to rewind the TAPE2 file and do a COPYSBF onto the OUTPUT file to obtain a listing of the profile data.

7) Execution of the OMEGA 11 program requires a CM of 60000_8. The files are setup as follows:

   OMEGA11(INPUT,OUTPUT,TAPE5=INPUT,TAPE6=OUTPUT,TAPE7,TAPE2)

   where TAPE7 is the reference file and TAPE2 is the profile dataset output file.

8) Data for aircraft code ACC will be deleted from the computer job and an error message printed when one or more of the following problems occur:

   (a) No reference data are found for ACC in TAPE7.

   (b) TAPE7 contains data for more than the maximum (6) number of operation power codes for ACC.

   (c) Error in reference dataset input caused by missing or extra data cards (angle ID errors).

   (d) The PSU from the code sheet doesn't match the first power setting units for ACC in TAPE7.

(e) The requested special case power setting (PSC for IFC=1) was not found in TAPE7.

(f) One or more requested power settings (PSC's) are outside the range of the power setting data available in TAPE7.

9) The entire computer job will be terminated when either of the following occur:

(a) The number of power settings requested (NP) is greater than the maximum number permitted (NPM=6). An error message will be printed.

(b) An "END OF FILE" is read from this input file. This is the normal job termination.

APPENDIX C
OMEGA 10 SAMPLE PROBLEM

This sample problem for the OMEGA 10 program inputs the flight noise reference datasets for the C-141 aircraft from the NOISEFILE 4 database and interpolates profile data for the power settings requested on the code sheet. The following items are included in this Appendix:

(1) The completed OMEGA 10 code sheet.

(2) A listing of the code sheet and reference file input data.

(3) The tab output.

(4) A listing of the flight noise profile datasets written on file TAPE3.

OMEGA 10 PROGRAM CODE SHEET

I. JOB CONTROL CARD (One Per Job):

Col. 1 1 5 b M A R b 7 2 DATE; eg 29 JUN 77
11 1 5 0 3 8 2 DATN; Data in DAMOYR form, eg. 290677
18 1 IPR [0-- no print]
20 __ MEAS(1) EPNL [0 for IPR=0; 1 for IPR=1]
22 __ MEAS(2) SELT [0 for IPR=0; 1 for IPR=1]
24 __ MEAS(3) SEL [1 for IPR=0; 1 for IPR=1]
26 1 IPU [1 for IPR=0; 0 for IPR=1]

II. OUTPUT PARAMETERS FOR EACH AIRCRAFT (2 or 3 Cards):

Card #1

Col. 1 0 2 7 ACC
4 _ 7 5 ITEMP [59°F]
7 _ 6 0 IRHUM [70%]
11 7 PV [w]
13 1 CRI [0]
15 _ _ _ _ _ DELN [0.0]
20 _ 2 NP
22 E P R _ _ _ PSU (left justify)

Card #2 (Profile Output Power Data)

Col. 1 _ 1 . 9 0	PSC #1	Col. 6 2 5 0	VX	Col. 9 0 3	OPCR	Col. 11 0 3	OPCC [81]
13 _ 1 . 7 0	PSC #2	18 3 2 0	VX	21 0 4	OPCR	23 _ _	OPCC [82]
25 _ _ _ _ _	PSC #3	30 _ _ _	VX	33 _ _	OPCR	35 _ _	OPCC [83]
37 _ _ _ _ _	PSC #4	42 _ _ _	VX	45 _ _	OPCR	47 _ _	OPCC [84]
49 _ _ _ _ _	PSC #5	54 _ _ _	VX	57 _ _	OPCR	59 _ _	OPCC [85]
61 _ _ _ _ _	PSC #6	66 _ _ _	VX	69 _ _	OPCR	71 _ _	OPCC [86]

Card #3 (Profile Output Power Data Conti.; required only when NP>6)

Col. 1 _ _ _ _ _	PSC #7	Col. 6 _ _ _	VX	Col. 9 _ _	OPCR	Col. 11 _ _	OPCC [87]
13 _ _ _ _ _	PSC #8	18 _ _ _	VX	21 _ _	OPCR	23 _ _	OPCC [88]
25 _ _ _ _ _	PSC #9	30 _ _ _	VX	33 _ _	OPCR	35 _ _	OPCC [89]
37 _ _ _ _ _	PSC #10	42 _ _ _	VX	45 _ _	OPCR	47 _ _	OPCC [90]
49 _ _ _ _ _	PSC #11	54 _ _ _	VX	57 _ _	OPCR	59 _ _	OPCC [91]
61 _ _ _ _ _	PSC #12	66 _ _ _	VX	69 _ _	OPCR	71 _ _	OPCC [92]

(Right Justify "PSC" Data)

III. TERMINATE SETUP DECK WITH AN "END OF RECORD" OR "END OF JOB" CARD

---

(1) Repeat section II for each aircraft set in the job.
(2) [ ] -- Program default values for the above parameters.
(3) See Standard Procedure for Setup and Execution of the OMEGA 10 Program for above parameter definitions.

```
OMEGA 10 SAMPLE PROBLEM CODE SHEET INPUT FILE:


15 MAR 82 150382 1        1
027 75 50 Z 1        2EPR
 1.902500303 1.7032004




OMEGA 10 REFERENCE FILE INPUT DATA (FILE TAPE7):


COMMENT 02703180 OMEGA 6.7 27 DEC 79 C-141   1000 FT  250 KTS   59 F   70 PCT
COMMENT 02703180 TURBOFAN        NO DRAG
COMMENT 02703180 TAKEOFF POWER         1.90 EPR
2670271032712791C-141      TAKEOFF POWER          8 1000  250  878
267027103271279211451166 9991020110510581071  21 793 773 787 894 929 934 867 90
2670271032712793 911 913 893 902 866 887 879 879 864 866 924 866 732 760 680 59
COMMENT 02704180 OMEGA 6.7 27 DEC 79 C-141   1000 FT  300 KTS   59 F   70 PCT
COMMENT 02704180 TURBOFAN        NO DRAG
COMMENT 02704180 CRUISE POWER         1.52 EPR
2670271042712791C-141      CRUISE POWER          8 1000  300  967
267027104271279211241155 9771008107610061034  31 735 719 722 751 813 848 831 80
2670271042712793 813 848 812 811 799 807 814 803 816 915 905 806 775 748 659 53
COMMENT 02705180 OMEGA 6.7 27 DEC 79 C-141   1000 FT  140 KTS   59 F   70 PCT
COMMENT 02705180 TURBOFAN        FLAPS ON, GEAR UP
COMMENT 02705180 APPROACH POWER         1.20 EPR
2670271052712791C-141      APPROACH POWER          4 1000  140 1061
267027105271279210661095 923 9521064 9991024  29 688 654 650 671 748 748 729 73
2670271052712793 715 754 725 732 729 733 747 753 827 887 777 791 778 714 664 50
```

USAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAF

C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141

C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141

C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141

NOISE PRODUCED ON THE GROUND BY

C-141 AIRCRAFT

DURING FLIGHT OPERATIONS

FLYOVER MEASUREMENTS
AIRCRAFT CODE: 027
PROFILE VERSION: Z
COMPUTER PROGRAM OMEGA 10.3

15 MAR 82

A E R O S P A C E   M E D I C A L   R E S E A R C H   L A B O R A T O R Y
W R I G H T - P A T T E R S O N   A I R   F O R C E   B A S E ,   O H I O

C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141

C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141

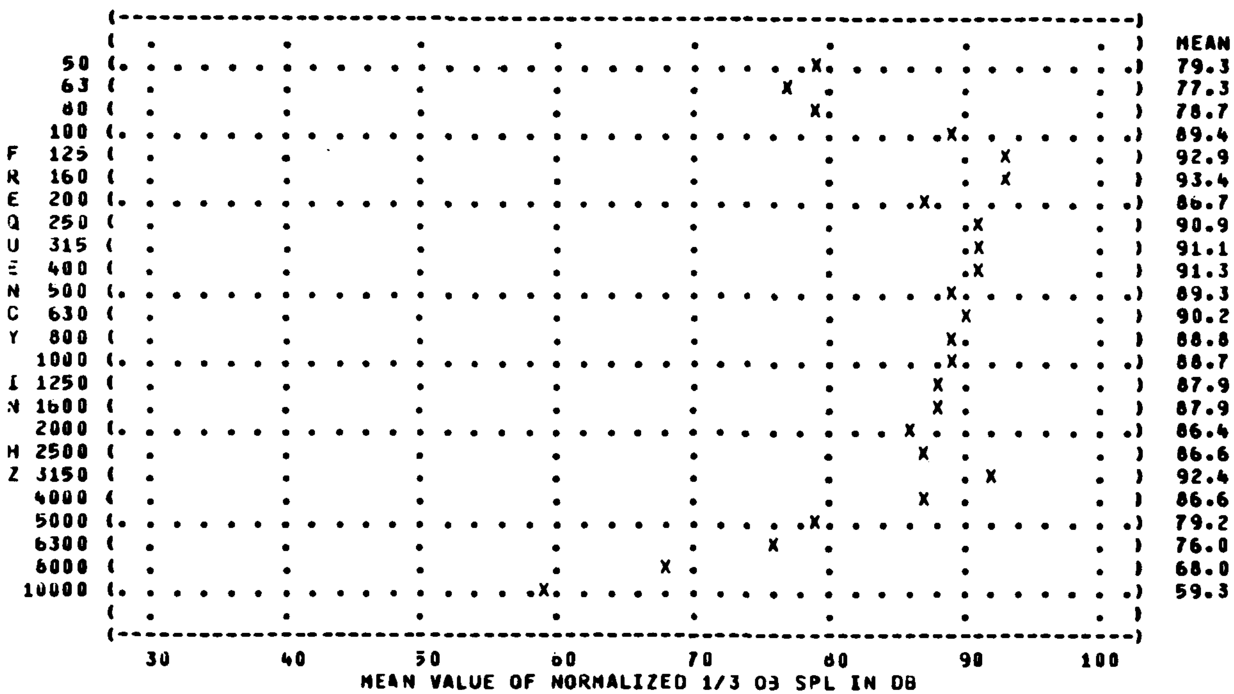
C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141

USAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAF

OMEGA 10.3

A/C CODE: 027
OPS CODE: 103
DATE: 15 MAR 82

PAGE G1



C-141 TAKEOFF POWER 1.90 EPR

AIRSPEED = 250 KNOTS
SLANT DISTANCE = 1000 FEET

TEMP = 59 F
REL HUMID = 70 %

NO. OF RECORDS = 8

IDENT: 10.3-027-103-150382

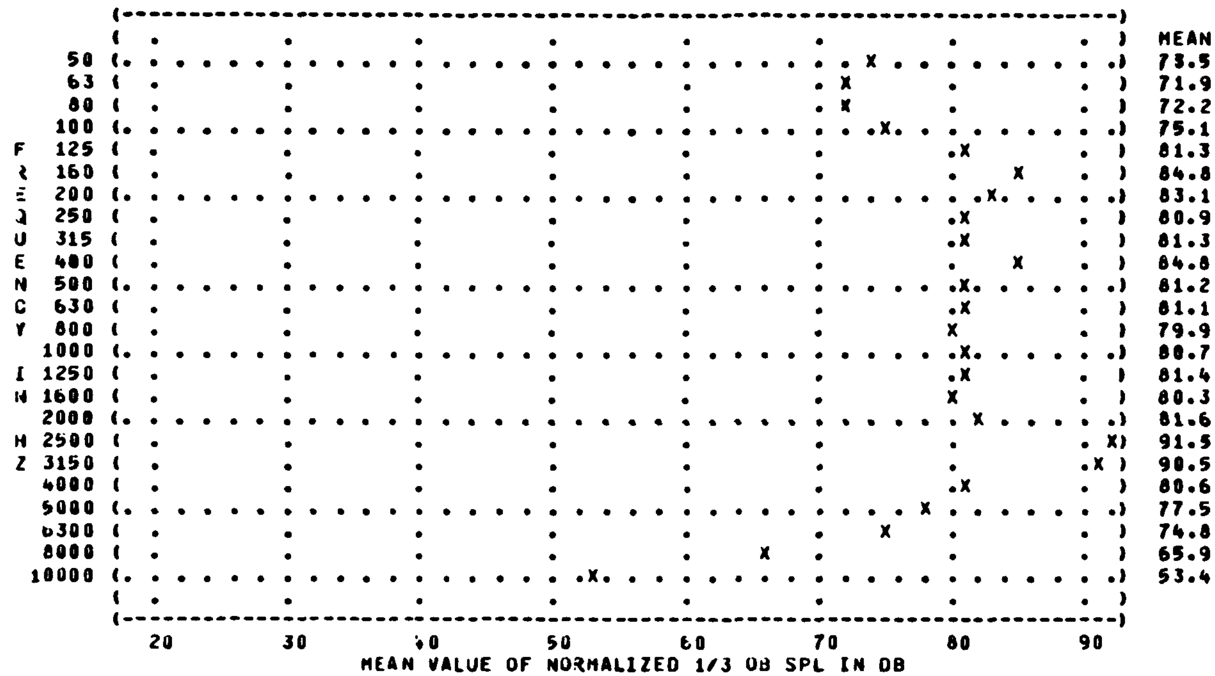
DATA FROM OMEGA 6.7 JOB COMPUTED ON 27 DEC 79
ENGINE TYPE: TURBOFAN
DRAG CONFIGURATION: NO DRAG

PNLT = 116.3 PNDB
PNL = 114.4 PNDB
ALT = 101.6 DBA
AL = 99.7 DBA
C = 1.9 DB
EPNL = 110.5 EPNDB
SEL = 105.8 DB
SELT = 107.1 DB
THETA= 87.8 DEG

OMEGA 10.3

A/C CODE: 027
OPS CODE: 104
DATE: 15 MAR 82

PAGE G2



C-141 CRUISE POWER 1.52 EPR

AIRSPEED = 300 KNOTS
SLANT DISTANCE = 1000 FEET

TEMP = 59 F
REL HUMID = 70 %

NO. OF RECORDS = 8

IDENT: 10.3-027-104-150382

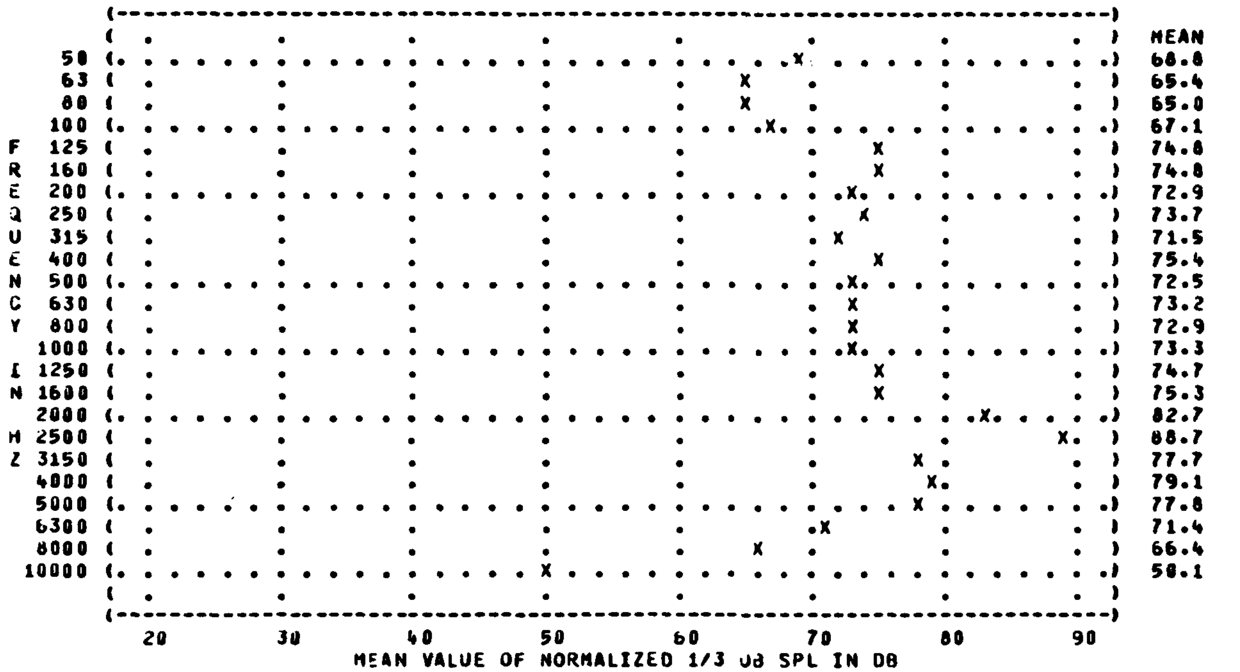
DATA FROM OMEGA 5.7 JOB COMPUTED ON 27 DEC 79
ENGINE TYPE: TURBOFAN
DRAG CONFIGURATION: NO DRAG

PNLT = 112.5 PNDB
PNL = 110.7 PNDB
ALT = 98.5 DBA
AL = 96.7 DBA
C = 1.8 DB
EPNL = 107.8 EPNDB
SEL = 100.6 DB
SELT = 103.4 DB
THETA= 96.7 DEG

OMEGA 10.3

A/C CODE: 027
OPS CODE: 105
DATE: 15 MAR 82

PAGE G3



C-141 APPROACH POWER 1.20 EPR

AIRSPEED = 140 KNOTS
SLANT DISTANCE = 1000 FEET

TEMP = 59 F
REL HUMID = 70 %

NO. OF RECORDS = 4

IDENT: 10.3-027-105-150382

DATA FROM OMEGA 6.7 JOB COMPUTED ON 27 DEC 79
ENGINE TYPE: TURBOFAN
DRAG CONFIGURATION: FLAPS DN, GEAR UP

PNLT = 109.4 PNDB
PNL = 106.5 PNDB
ALT = 95.1 DBA
AL = 92.2 DBA
C = 2.9 DB
EPNL = 106.4 EPNDB
SEL = 99.9 DB
SELT = 102.4 DB
THETA= 106.1 DEG

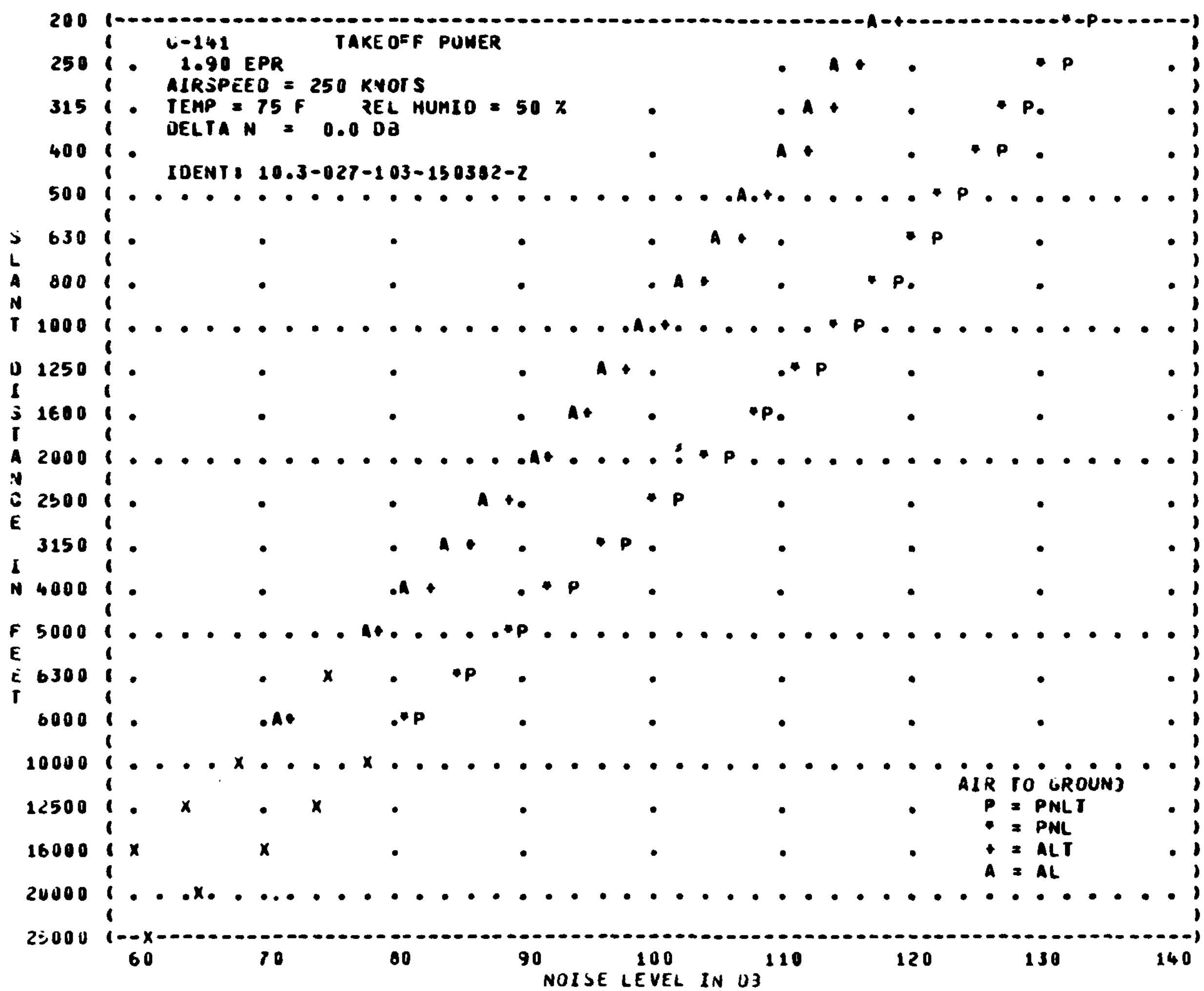
TABLE: SINGLE EVENT NOISE AS A FUNCTION OF SLANT DISTANCE*	IDENTIFICATION:
AIR-TO-GROUND PROPAGATION	OMEGA 10.3
AIRCRAFT: C-141 / OPERATION: TAKEOFF POWER 1.90 EPR, AIRSPEED = 250 KNOTS / METEOROLOGY: TEMP = 75 F, REL HUMID = 50 %, DELTA N = 0.0 DB	A/C CODE: 027 OPS CODE: 103 PROFILE VER: Z 15 MAR 82 PAGE I1

SLANT DISTANCE (FEET)	AL (DBA)	ALT** (DBA)	PNL (PNDB)	PNLT** (PNDB)	SEL (DB)	SELT** (DB)	EPNL** (EPNDB)
200	116.6	118.5	132.0	134.0	116.5	119.8	123.9
250	114.3	115.3	129.8	131.7	116.9	118.2	122.3
315	112.0	114.0	127.4	129.4	115.2	116.5	120.5
400	109.7	111.6	125.0	126.9	113.4	114.7	118.7
500	107.2	109.1	122.5	124.4	111.6	112.9	116.8
630	104.7	106.6	119.8	121.8	109.6	110.9	114.7
800	102.1	104.0	117.0	119.0	107.6	108.9	112.5
1000	99.3	101.3	114.1	116.0	105.5	106.8	110.2
1250	96.5	98.4	110.9	112.8	103.2	104.5	107.6
1600	93.5	95.5	107.5	109.4	100.9	102.2	104.8
2000	90.5	92.5	103.9	105.8	98.5	99.8	101.8
2500	87.5	89.4	99.9	101.9	96.0	97.3	98.4
3150	84.3	85.3	95.7	97.6	93.5	94.8	94.8
4000	81.2	82.7	92.3	93.8	90.9	92.0	91.7
5000	77.9	79.1	88.8	90.0	88.3	89.1	88.6
6300	74.6	75.4	85.2	86.0	85.6	86.1	85.3
8000	71.2	71.6	81.4	81.8	82.7	83.0	81.9
10000	67.6	67.6	77.6	77.6	79.7	79.7	78.4
12500	63.8	63.6	73.7	73.7	76.6	76.6	75.1
16000	59.9	59.9	69.7	69.7	73.3	73.3	71.7
20000	55.8	55.6	65.4	65.4	69.8	69.8	68.0
25000	51.6	51.6	60.8	60.8	65.1	66.1	64.0

* EXTRAPOLATED FROM MEAN VALUES FOR LEVEL FLIGHTS.
** BASED ON SMOOTHED TONE CORRECTION FUNCTION.

OMEGA 10.3

A/C CODE: 027
OPS CODE: 103
PROFILE VER: Z
DATE: 15 MAR 82
PAGE J1



OMEGA 10.3

A/C CODE: 027
OPS CODE: 103
PROFILE VER: Z
DATE: 15 MAR 82
PAGE K1

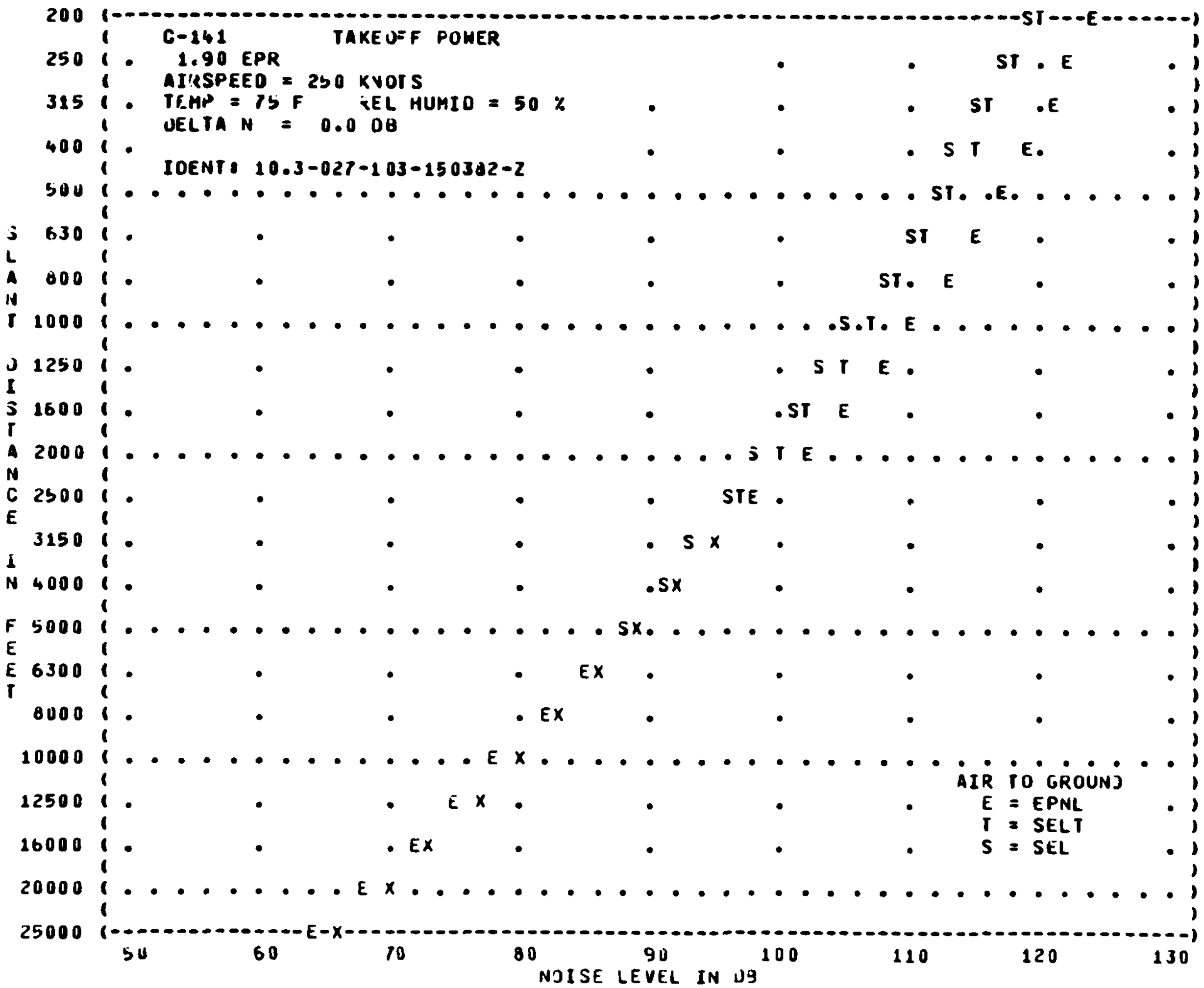


TABLE: SINGLE EVENT NOISE AS A FUNCTION OF SLANT DISTANCE*

GROUND-TO-GROUND PROPAGATION

IDENTIFICATION:
OMEGA 10.3
A/C CODE: 027
OPS CODE: 103
PROFILE VER: Z
15 MAR 82
PAGE M1

AIRCRAFT: C-141

OPERATION: TAKEOFF POWER 1.90 EPR
AIRSPEED = 250 KNOTS

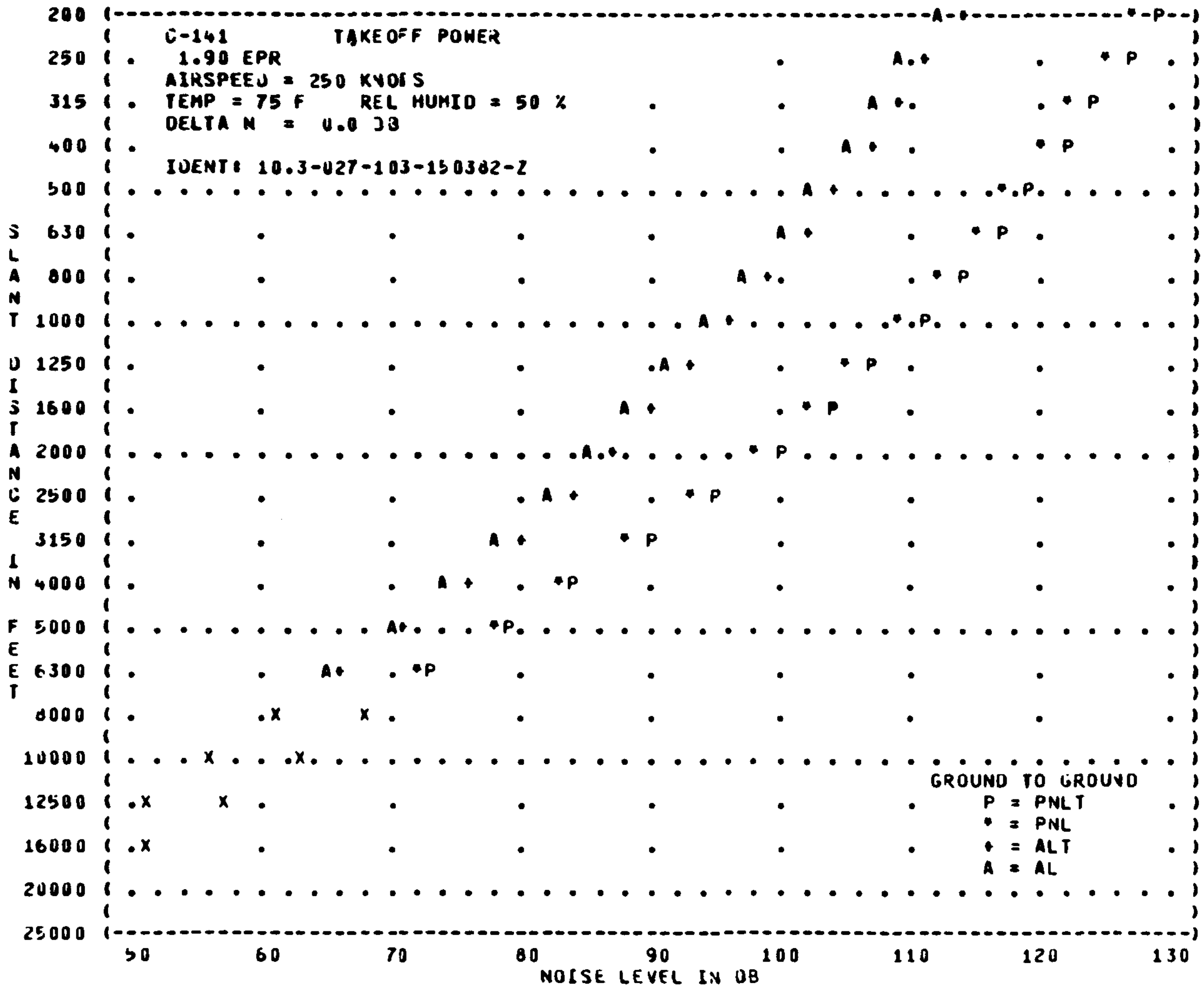
METEOROLOGY: TEMP = 75 F
REL HUMID = 50 %
DELTA N = 0.0 DB

SLANT DISTANCE (FEET)	AL (DBA)	ALT** (DBA)	PNL (PNDB)	PNLT** (PNDB)	SEL (DB)	SELT** (DB)	EPNL** (EPNDB)
200	111.6	113.5	127.0	129.0	113.5	114.8	118.9
250	109.3	111.3	124.8	126.7	111.9	113.2	117.3
315	107.0	109.0	122.4	124.3	110.2	111.5	115.5
400	104.7	106.6	120.0	121.9	108.4	109.7	113.7
500	102.2	104.1	117.4	119.4	106.6	107.9	111.7
630	99.7	101.6	114.7	116.7	104.6	105.9	109.6
800	97.0	99.9	111.9	113.8	102.6	103.9	107.4
1000	94.2	95.2	108.8	110.7	100.4	101.7	104.9
1250	91.3	93.3	105.5	107.4	98.1	99.4	102.2
1600	88.3	90.2	101.8	103.8	95.6	96.9	99.1
2000	85.1	87.1	97.8	99.7	93.1	94.4	95.7
2500	81.7	83.7	93.3	95.2	90.3	91.6	91.8
3150	78.1	80.0	88.2	90.2	87.2	88.5	87.3
4000	74.1	75.7	82.8	84.4	83.9	84.9	82.3
5000	69.7	70.9	77.7	78.8	80.1	80.9	77.5
6300	65.0	65.8	72.2	73.0	75.9	76.5	72.4
8000	60.6	61.0	67.6	68.0	72.2	72.4	68.0
10000	55.9	55.9	62.6	62.6	68.0	68.0	63.4
12500	50.7	50.7	57.1	57.1	63.5	63.5	58.5
16000	45.2	45.2	51.2	51.2	58.5	58.5	53.2
20000	39.2	39.2	44.6	44.6	53.1	53.1	47.2
25000	32.7	32.7	36.5	36.5	47.3	47.3	39.7

* EXTRAPOLATED FROM MEAN VALUES FOR LEVEL FLIGHTS.
** BASED ON SMOOTHED TONE CORRECTION FUNCTION.

OMEGA 10.3

A/C CODE: 027
OPS CODE: 103
PROFILE VER: Z
DATE: 15 MAR 82
PAGE N1



OMEGA 10.3

A/C CODE: 027
OPS CODE: 103
PROFILE VER: Z
DATE: 15 MAR 82
PAGE 01

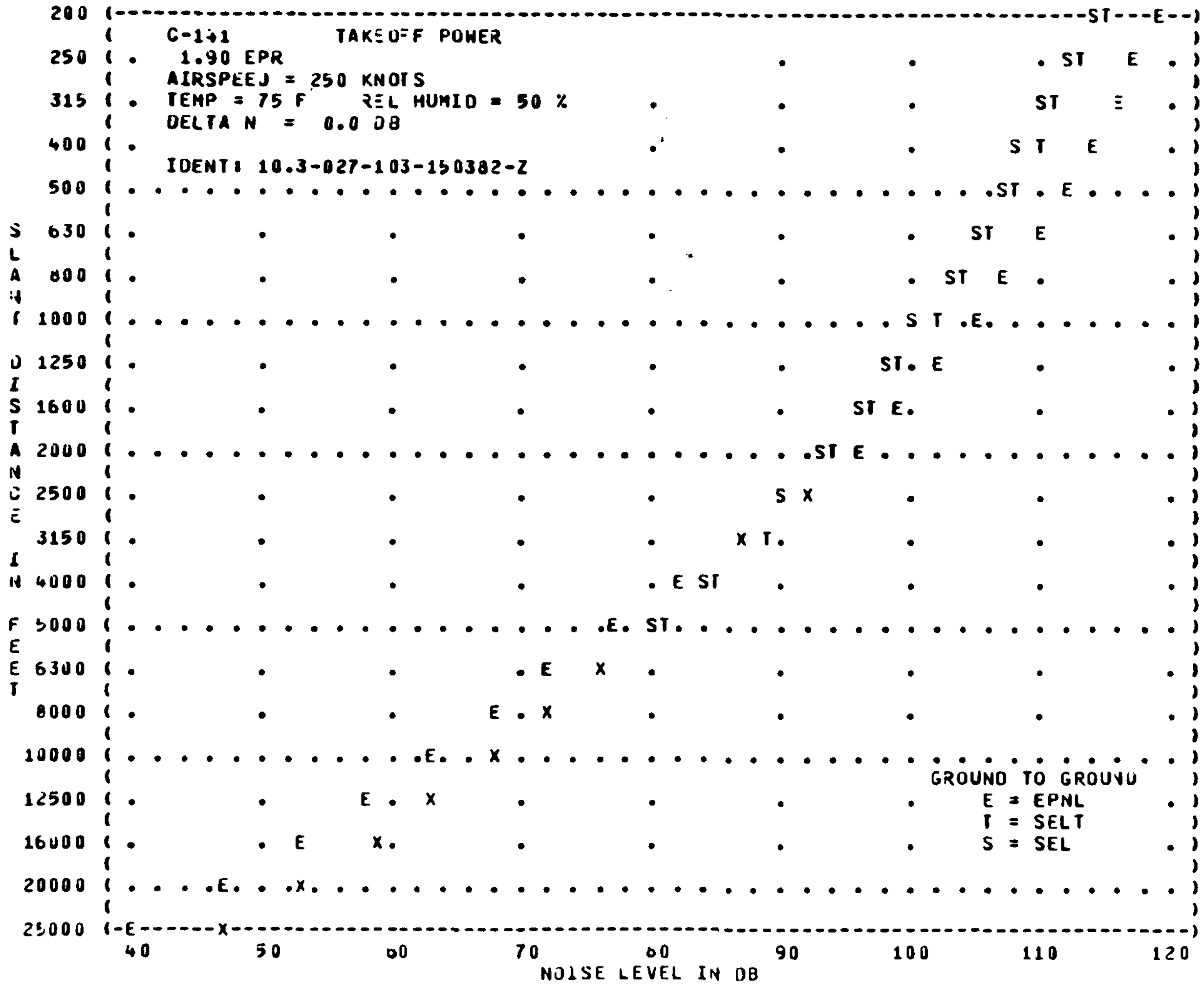


TABLE: SINGLE EVENT NOISE AS A FUNCTION OF SLANT DISTANCE*

AIR-TO-GROUND PROPAGATION

IDENTIFICATION:
OMEGA 10.3
A/C CODE: 827
OPS CODE: 182
PROFILE VER: Z
15 MAR 82
PAGE I2

AIRCRAFT: C-141

OPERATION: CRUISE POWER 1.70 EPR
AIRSPEED = 320 KNOTS

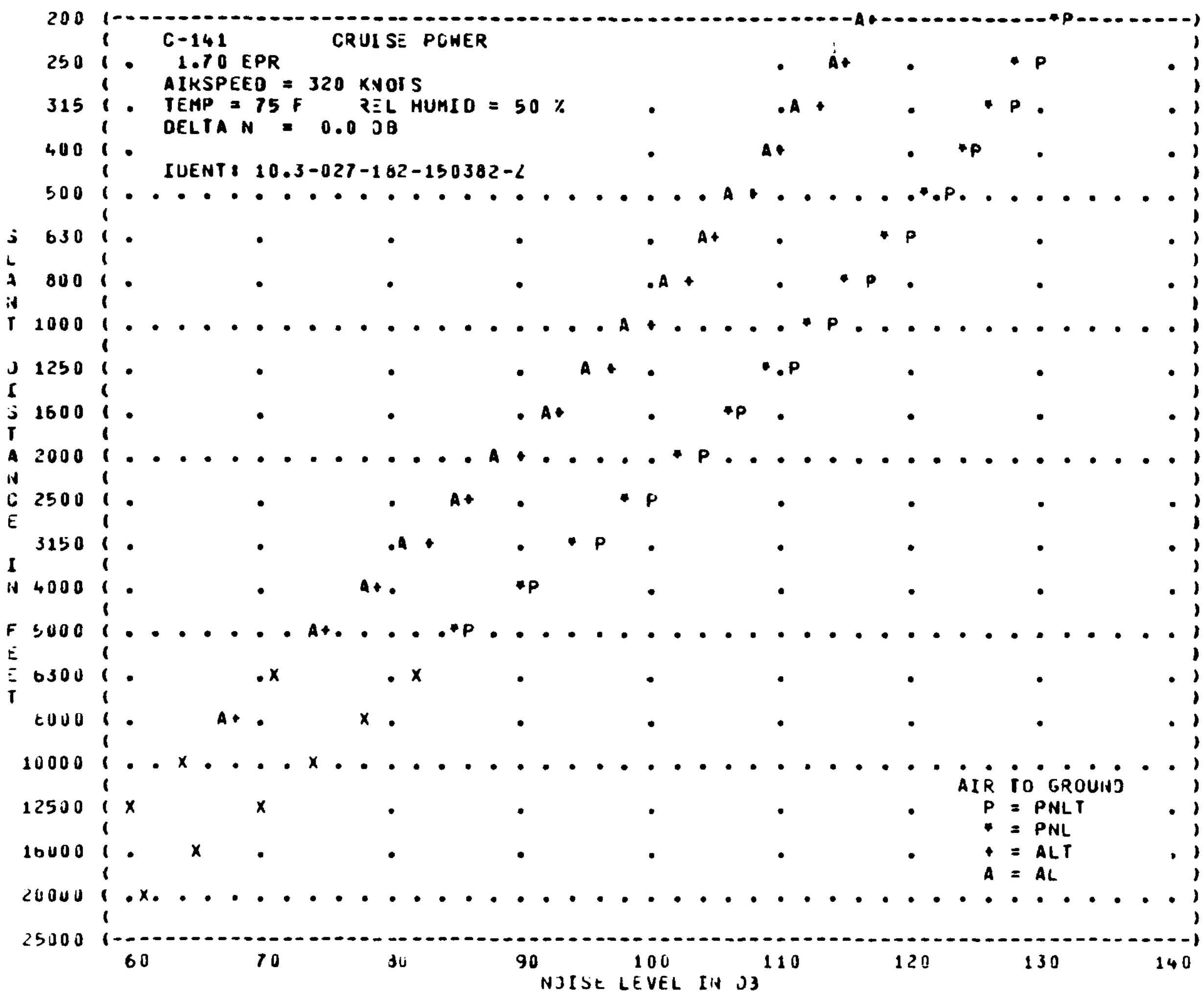
METEOROLOGY: TEMP = 75 F
REL HUMID = 50 %
DELTA N = 0.0 DB

SLANT DISTANCE (FEET)	AL (DBA)	ALT** (DBA)	PNL (PNDB)	PNLT** (PNDB)	SEL (DB)	SELT** (DB)	EPNL** (EPNDB)
200	115.9	117.5	130.6	132.2	115.6	118.1	122.9
250	113.7	115.2	128.3	129.9	114.0	116.5	121.3
315	111.3	112.9	126.0	127.5	112.2	114.7	119.5
400	108.9	110.5	123.5	125.1	110.4	112.9	117.6
500	106.4	108.0	121.0	122.5	108.5	111.0	115.7
630	103.8	105.4	118.3	119.3	106.5	109.0	113.6
800	101.1	102.6	115.4	117.0	104.4	106.9	111.3
1000	98.2	93.7	112.4	113.9	102.1	104.6	108.9
1250	95.1	96.7	109.2	110.8	99.6	102.1	106.3
1600	91.8	93.4	105.9	107.5	97.0	99.5	103.6
2000	88.4	90.0	102.3	103.8	94.1	96.6	100.6
2500	84.8	85.4	98.4	99.9	91.1	93.6	97.3
3150	81.2	82.7	94.1	95.7	88.1	90.6	93.6
4000	77.6	78.8	89.8	91.1	85.1	87.1	89.4
5000	74.1	75.0	85.2	86.1	82.2	83.7	84.9
6300	70.7	71.3	81.7	82.3	73.4	80.4	81.5
8000	67.3	67.6	78.0	78.3	76.6	77.1	77.9
10000	63.7	63.7	74.0	74.0	73.6	73.6	74.0
12500	60.0	60.0	69.8	69.8	70.5	70.5	70.4
16000	56.1	55.1	65.4	65.4	67.2	67.2	66.6
20000	51.9	51.9	60.9	60.9	63.6	63.6	62.7
25000	47.5	47.5	56.6	56.6	59.9	59.9	59.0

* EXTRAPOLATED FROM MEAN VALUES FOR LEVEL FLIGHTS.
** BASED ON SMOOTHED TONE CORRECTION FUNCTION.

OMEGA 10.1

A/C CODE: 027
OPS CODE: 182
PROFILE VER: Z
DATE: 15 MAR 82
PAGE J2



OMEGA 10.3

A/C CODE: 027
OPS CODE: 182
PROFILE VER: Z
DATE: 15 MAR 82
PAGE K2

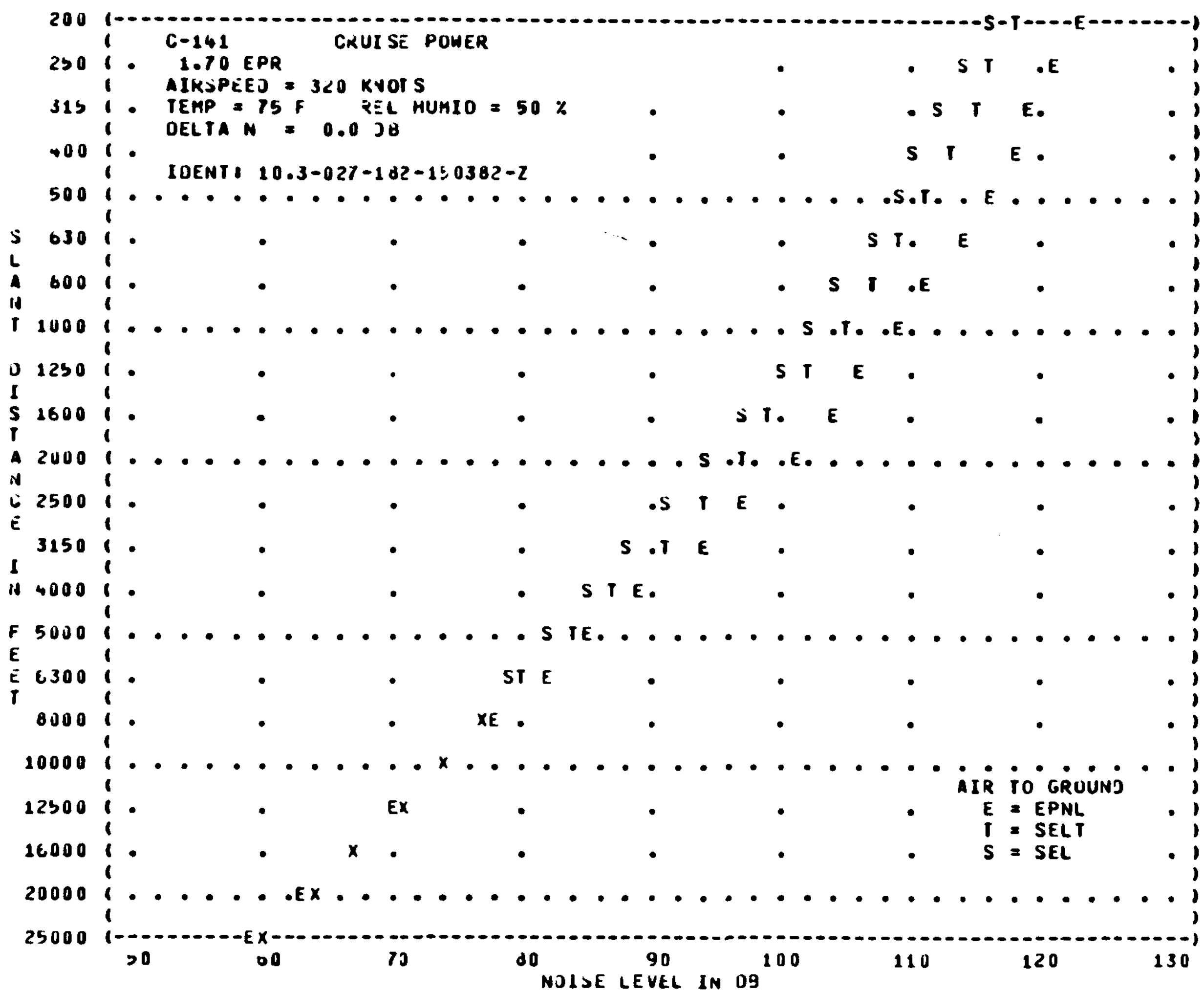


TABLE: SINGLE EVENT NOISE AS A FUNCTION OF SLANT DISTANCE*

GROUND-TO-GROUND PROPAGATION

IDENTIFICATION:

OMEGA 10.3

A/C CODE: 027
OPS CODE: 182
PROFILE VER: Z
15 MAR 82
PAGE M2

AIRCRAFT: C-141

OPERATION: CRUISE POWER 1.70 EPR

AIRSPEED = 320 KNOTS

METEOROLOGY: TEMP = 75 F
REL HUMID = 50 %

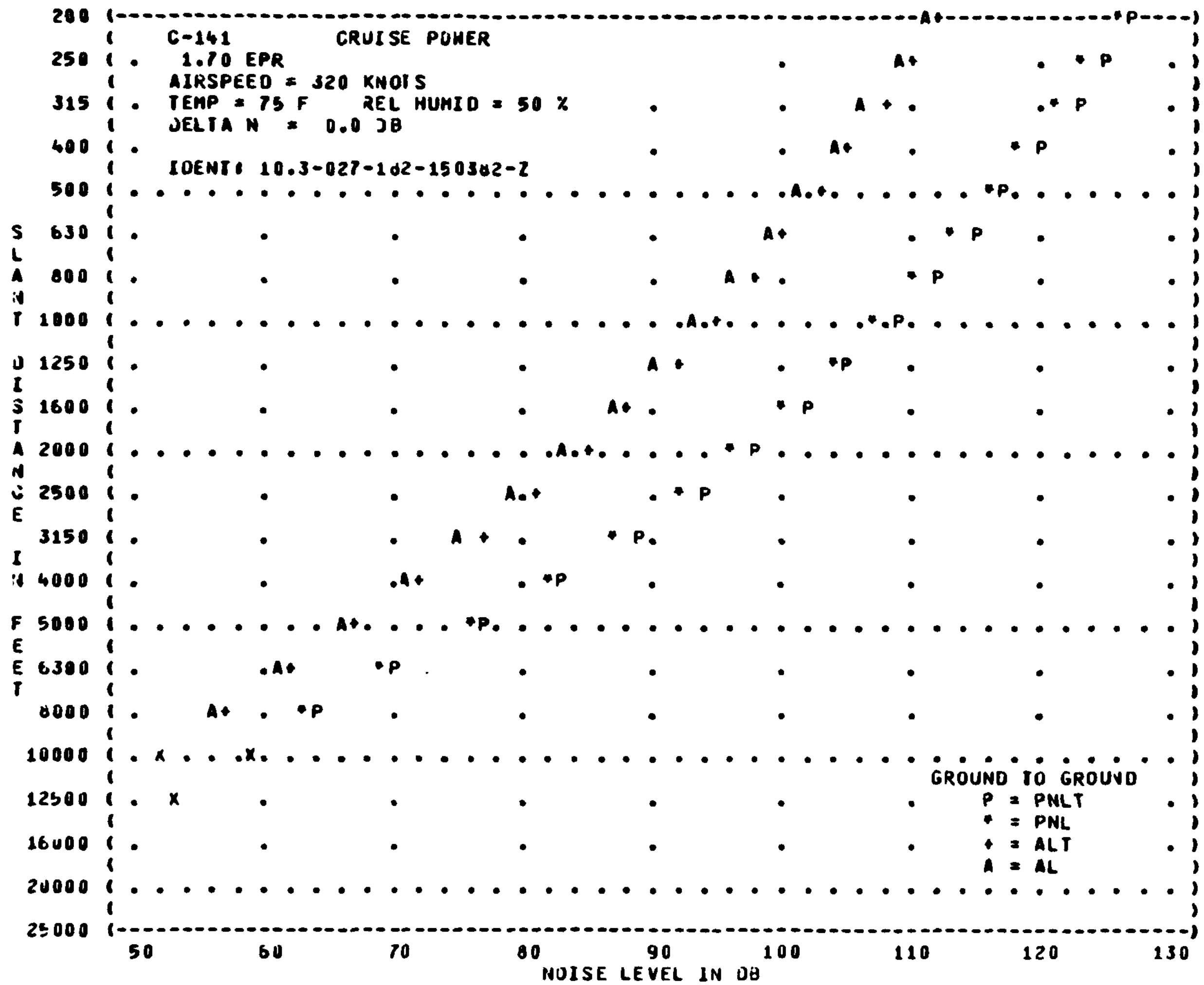
DELTA N = 0.0 DB

SLANT DISTANCE (FEET)	AL (DBA)	ALT** (DBA)	PNL (PNDB)	PNLT** (PNDB)	SEL (DB)	SELT** (DB)	EPNL** (EPNDB)
200	110.9	112.5	125.6	127.2	110.6	113.1	117.9
250	108.7	110.2	123.3	124.9	109.0	111.5	116.2
315	106.3	107.9	121.0	122.5	107.2	109.7	114.5
400	103.9	105.5	118.5	120.1	105.4	107.9	112.6
500	101.4	103.0	115.9	117.5	103.5	106.0	110.6
630	98.8	100.4	113.2	114.7	101.5	104.0	108.5
800	96.0	97.6	110.3	111.8	99.4	101.9	106.2
1000	93.1	94.7	107.1	108.7	97.0	99.5	103.6
1250	90.0	91.6	103.9	105.4	94.5	97.0	101.0
1600	86.7	88.3	100.3	101.9	91.8	94.3	98.0
2000	83.2	84.7	96.4	98.0	88.9	91.4	94.7
2500	79.3	80.9	92.1	93.6	85.6	88.1	91.0
3150	75.2	75.8	87.2	88.7	82.1	84.6	86.7
4000	70.8	72.0	81.7	83.0	78.3	80.3	81.3
5000	66.0	65.9	75.8	76.7	74.1	75.6	75.5
6300	61.0	61.6	69.3	69.9	69.7	70.7	69.1
8000	56.5	55.8	63.2	63.5	65.8	66.3	63.1
10000	51.8	51.6	58.6	58.6	61.7	61.7	58.6
12500	46.7	45.7	53.2	53.2	57.2	57.2	53.8
16000	41.2	41.2	47.1	47.1	52.3	52.3	48.3
20000	35.3	35.3	41.3	41.3	47.0	47.0	43.1
25000	29.0	29.0	32.1	32.1	41.3	41.3	34.5

* EXTRAPOLATED FROM MEAN VALUES FOR LEVEL FLIGHTS.
** BASED ON SMOOTHED TONE CORRECTION FUNCTION.

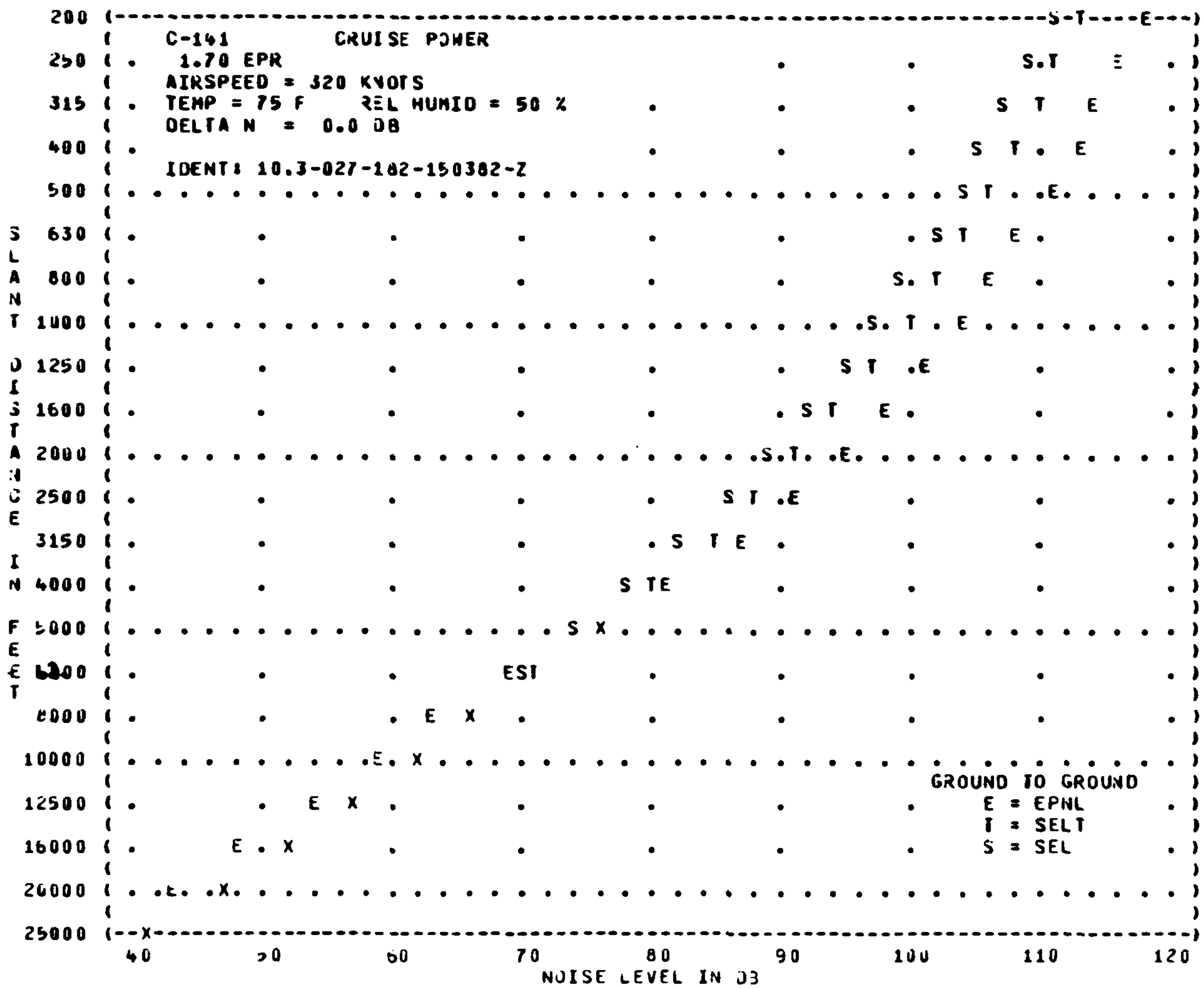
OMEGA 10.3

A/C CODE: 027
OPS CODE: 182
PROFILE VER: Z
DATE: 15 MAR 82
PAGE N2



OMEGA 10.3

A/C CODE: 027
OPS CODE: 182
PROFILE VER: Z
DATE: 15 MAR 82
PAGE 02



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SUMMARY OF I/O FOR AIRCRAFT: C-141

PROGRAM:  OMEGA 10.3
AIRCRAFT CODE: 027
PROFILE VERSION CODE: Z
COMDECK REVISION IDENTIFIER: 1
DATE: 15 MAR 82
DELTA N (OR DELN)=  0.00 DB

********************************** INPUT DATA **********************************
  COMDECK          POWER     AIRSPEED POWER DESCRIPTION        DATE OF
   NAME     OPC   SETTING     KNOTS                            NORM. RUN
N02703180   03   1.90 EPR     250    TAKEOFF POWER           27 DEC 79
N02704180   04   1.52 EPR     308    CRUISE POWER            27 DEC 79
N02705180   05   1.20 EPR     140    APPROACH POWER          27 DEC 79

********************************** OUTPUT DATA **********************************
IS PROFILE DATA WRITTEN ON FILE 'TAPE3'?--YES
MAXIMUM PERMITTED PROFILE DATA EXTRAPOLATION IS:  5.00 DB
ENGINE TYPE FOR ALL PROFILE DATA: TURBOFAN
METEOROLOGY:  TEMP       =    75 F
              REL HUMID  =    50 %

PROFILE          POWER    AIRSPEED POWER DESCRIPTION            NORMALIZED COMDECKS
  ID      OPC   SETTING    KNOTS                          REFERENCE    SLOPE REF. POINTS
02703121 03   1.90 EPR     250.0  TAKEOFF POWER          N02703180
02782121 82   1.70 EPR     320.0  CRUISE POWER           N02704180 N02705180 N02703180

****************************** GENERAL INFORMATION ******************************
OPC --- OPERATION POWER CODE.
THE ENGINE TYPE GIVEN ABOVE IS TAKEN FROM THE LAST REFERENCE FILE DATASET;
IT IS ASSUMED TO BE THE SAME FOR ALL DATASETS.
PROFILE COMDECK NAME = SYMBOL E, S OR L + PROFILE ID LISTED ABOVE
```

OMEGA 10 PROFILE DATASET OUTPUT FILE (FILE TAPE3):

```
*COMDECK E02703121
EPNL     027031         2   123.9   122.3   120.5   118.7   116.8   114.7C-141     1
COMMENT  02703121 OMEGA10.3 15 MAR 82 C-141             250 KTS     75 F    50 PCT
COMMENT  02703121 TURBOFAN          N02703180
COMMENT  02703121 TAKEOFF POWER          1.90 EPR
          112.5   110.2   107.6   104.8   101.8    98.4    94.8    91.7C-141     2
           88.6    85.3    81.9    78.4    75.1    71.7    68.0    64.0C-141     3
         027031       1   116.9   117.3   115.5   113.7   111.7   109.6C-141     4
          107.4   104.9   102.2    99.1    95.7    91.8    87.3    82.3C-141     5
           77.5    72.4    68.0    63.4    58.5    53.2    47.2    39.7C-141
*COMDECK S02703121
SELT     027031         2   119.8   118.2   116.5   114.7   112.9   110.9C-141     1
COMMENT  02703121 OMEGA10.3 15 MAR 82 C-141             250 KTS     75 F    50 PCT
COMMENT  02703121 TURBOFAN          N02703180
COMMENT  02703121 TAKEOFF POWER          1.90 EPR
          108.9   106.8   104.5   102.2    99.8    97.3    94.8    92.0C-141     2
           89.1    86.1    83.0    79.7    76.5    73.3    69.5    66.1C-141     3
         027031       1   114.8   113.2   111.5   109.7   107.3   105.9C-141     4
          103.9   101.7    99.4    96.9    94.4    91.6    88.5    84.9C-141     5
           80.9    76.5    72.4    68.0    63.5    58.5    53.1    47.3C-141
*COMDECK L02703121
SEL      027031         2   116.5   116.9   115.2   113.4   111.6   109.6C-141     1
COMMENT  02703121 OMEGA10.3 15 MAR 82 C-141             250 KTS     75 F    50 PCT
COMMENT  02703121 TURBOFAN          N02703160
COMMENT  02703121 TAKEOFF POWER          1.90 EPR
          107.6   105.5   103.2   100.9    98.5    96.0    93.5    90.9C-141     2
           68.3    85.6    82.7    79.7    76.6    73.3    69.8    66.1C-141     3
         027031       1   113.5   111.9   110.2   108.4   105.6   104.6C-141     4
          102.6   100.4    98.1    95.6    93.1    90.3    87.2    83.9C-141     5
           80.1    75.9    72.2    68.0    63.5    58.5    53.1    47.3C-141
*COMDECK E02782121
EPNL     027821         2   122.9   121.3   119.5   117.6   115.7   113.6C-141     1
COMMENT  02782121 OMEGA10.3 15 MAR 82 C-141             320 KTS     75 F    50 PCT
COMMENT  02782121 TURBOFAN          N02704180 N02705180 N02703180
COMMENT  02782121 CRUISE POWER           1.70 EPR
          111.3   108.9   106.3   103.6   100.6    97.3    93.6    89.4C-141     2
           84.9    81.5    77.9    74.0    70.4    66.6    62.7    59.0C-141     3
         027821       1   117.9   116.2   114.5   112.6   110.6   108.5C-141     4
          106.2   103.6   101.0    98.0    94.7    91.0    86.7    81.3C-141     5
           75.5    69.1    63.1    58.6    53.9    48.3    43.1    34.5C-141
*COMDECK S02782121
SELT     027821         2   118.1   116.5   114.7   112.9   111.0   109.0C-141     1
COMMENT  02782121 OMEGA10.3 15 MAR 82 C-141             320 KTS     75 F    50 PCT
COMMENT  02782121 TURBOFAN          N02704180 N02705180 N02703180
COMMENT  02782121 CRUISE POWER           1.70 EPR
          106.9   104.6   102.1    99.5    96.6    93.6    90.6    87.1C-141     2
           83.7    80.4    77.1    73.6    70.5    67.2    63.6    59.9C-141     3
         027821       1   113.1   111.5   109.7   107.9   106.0   104.0C-141     4
          101.9    99.5    97.0    94.3    91.4    88.1    84.6    80.3C-141     5
           75.6    70.7    66.3    61.7    57.2    52.3    47.0    41.3C-141
*COMDECK L02782171
SEL      027821         2   115.6   114.0   112.2   110.4   108.5   106.5C-141     1
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COMMENT 02782121 OMEGA10.3 15 MAR 82 C-141              320 KTS    75 F    50 PCT
COMMENT 02782121 TURBOFAN            N02704180 N02705180 N02703180
COMMENT 02782121 CRUISE POWER              1.70 EPR
           104.4     102.1      99.6      97.0      94.1      91.1      88.1      85.1C-141     2
            62.2      79.4      76.6      73.6      70.5      67.2      63.6      59.9C-141     3
          027821         1     110.6     109.0     107.2     105.4     103.5     101.5C-141     4
            99.4      97.0      94.5      91.8      88.9      85.6      82.1      78.3C-141     5
            74.1      69.7      65.8      61.7      57.2      52.3      47.0      41.3C-141
```

OMEGA 10 PROGRAM CODE SHEET

I. **JOB CONTROL CARD (One Per Job):**

Col. 1 1 5 b m a r b 8 2 DATE; eg 29 JUN 77
11 1 5 0 3 8 2 DATN; Data in DAMOYR form, eg. 290677
18 1 IPR [0-- no print]
20 ___ MEAS(1) EPNL [0 for IPR=0; 1 for IPR=1]
22 ___ MEAS(2) SELT [0 for IPR=0; 1 for IPR=1]
24 ___ MEAS(3) SEL [1 for IPR=0; 1 for IPR=1]
26 1 IPU [1 for IPR=0; 0 for IPR=1]

II. **OUTPUT PARAMETERS FOR EACH AIRCRAFT (2 or 3 Cards):**

Card #1

Col. 1 0 2 7 ACC
4 _ _ _ ITEMP [59°F]
7 _ _ _ IRHUM [70%]
11 _____ PV [w]
13 _____ CRI [0]
15 _ _ _ _ _ DELN [0.0]
20 _ _ NP
22 _ _ _ _ _ _ _ PSU (left justify)

Card #2 (Profile Output Power Data)

Col. 1	_ _ _ _ _ _	PSC #1	Col. 6	_ _ _	VX	Col. 9	_ _	OPCR	Col. 11	_ _	OPCC [81]
13	_ _ _ _ _ _	PSC #2	18	_ _ _	VX	21	_ _	OPCR	23	_ _	OPCC [82]
25	_ _ _ _ _ _	PSC #3	30	_ _ _	VX	33	_ _	OPCR	35	_ _	OPCC [83]
37	_ _ _ _ _ _	PSC #4	42	_ _ _	VX	45	_ _	OPCR	47	_ _	OPCC [84]
49	_ _ _ _ _ _	PSC #5	54	_ _ _	VX	57	_ _	OPCR	59	_ _	OPCC [85]
61	_ _ _ _ _ _	PSC #6	66	_ _ _	VX	69	_ _	OPCR	71	_ _	OPCC [86]

Card #3 (Profile Output Power Data Conti.; required only when NP>6)

Col. 1	_ _ _ _ _ _	PSC #7	Col. 6	_ _ _	VX	Col. 9	_ _	OPCR	Col. 11	_ _	OPCC [87]
13	_ _ _ _ _ _	PSC #8	18	_ _ _	VX	21	_ _	OPCR	23	_ _	OPCC [88]
25	_ _ _ _ _ _	PSC #9	30	_ _ _	VX	33	_ _	OPCR	35	_ _	OPCC [89]
37	_ _ _ _ _ _	PSC #10	42	_ _ _	VX	45	_ _	OPCR	47	_ _	OPCC [90]
49	_ _ _ _ _ _	PSC #11	54	_ _ _	VX	57	_ _	OPCR	59	_ _	OPCC [91]
61	_ _ _ _ _ _	PSC #12	66	_ _ _	VX	69	_ _	OPCR	71	_ _	OPCC [92]

(Right Justify "PSC" Data)

III. **TERMINATE SETUP DECK WITH AN "END OF RECORD" OR "END OF JOB" CARD**

---

(1) Repeat section II for each aircraft set in the job.
(2) [ ] -- Program default values for the above parameters.
(3) See Standard Procedure for Setup and Execution of the OMEGA 10 Program for above parameter definitions.

OMEGA 10 CODE SHEET INPUT

```
15 MAR 82 150382 1        1
027
```

OMEGA 10 REFERENCE FILE INPUT (FILE TAPE7):

```
COMMENT 02703180 OMEGA 6.7 27 DEC 79 C-141   1000 FT  250 KTS   59 F   70 PCT
COMMENT 02703180 TURBOFAN         NO DRAG
COMMENT 02703180 TAKEOFF POWER         1.90 EPR
2670271032712791C-141      TAKEOFF POWER           8 1000  250  878
267027103271279211451166 9991020110510581071  21 793 773 787 894 929 934 867 909
2670271032712793 911 913 893 902 888 887 879 879 864 866 924 866 732 760 680 593
```

USAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAF

USAF C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141 USAF

USAF C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141 USAF

USAF C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141 USAF

NOISE PRODUCED ON THE GROUND BY

C-141 AIRCRAFT

DURING FLIGHT OPERATIONS

FLYOVER MEASUREMENTS
AIRCRAFT CODE: 027
PROFILE VERSION: W
COMPUTER PROGRAM OMEGA 10.3

15 MAR 82

A E R O S P A C E   M E D I C A L   R E S E A R C H   L A B O R A T O R Y
W R I G H T - P A T T E R S O N   A I R   F O R C E   B A S E ,   O H I O

USAF C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141 USAF

USAF C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141 USAF

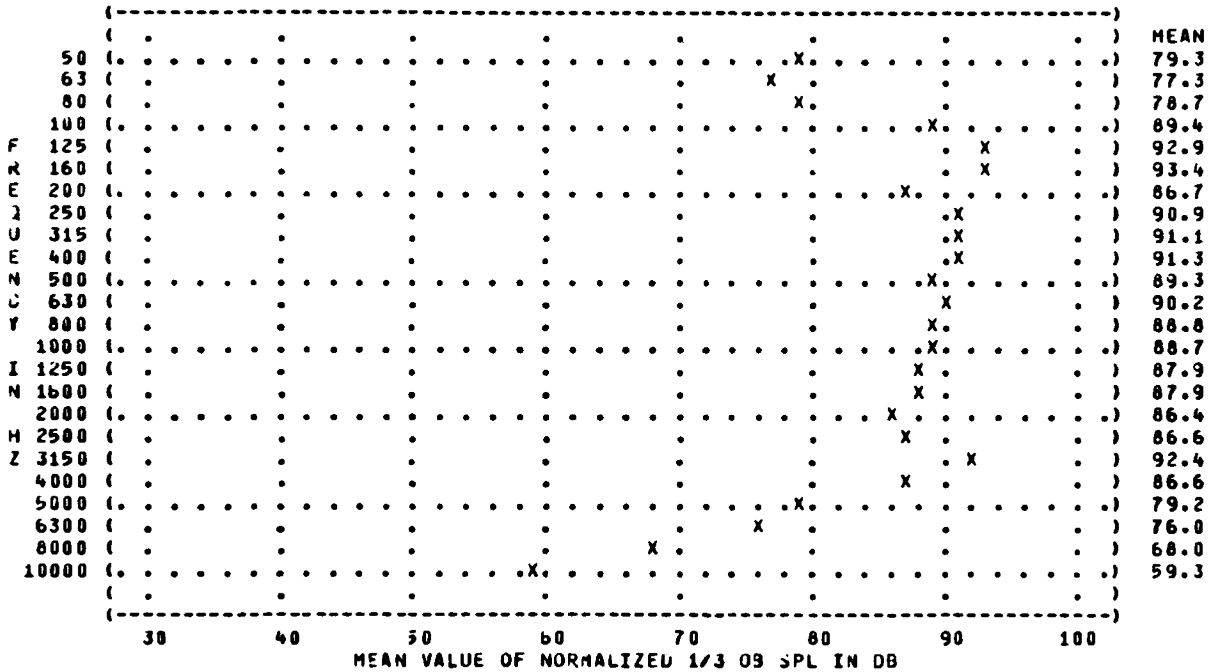
USAF C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141 AIRCRAFT C-141 USAF

USAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAFUSAF

OMEGA 10.3

A/C CODE: 027
OPS CODE: 103
DATE: 15 MAR 82

PAGE G1



C-141 TAKEOFF POWER 1.90 EPR

AIRSPEED = 250 KNOTS
SLANT DISTANCE = 1000 FEET

TEMP = 59 F
REL HUMID = 70 %

NO. OF RECORDS = 8

IDENT: 10.3-027-103-150382

DATA FROM OMEGA 6.7 JOB COMPUTED ON 27 DEC 79
ENGINE TYPE: TURBOFAN
DRAG CONFIGURATION: NO DRAG

PNLT = 116.3 PNDB
PNL = 114.4 PNDB
ALT = 101.6 DBA
AL = 93.7 DBA
C = 1.9 DB
EPNL = 110.5 EPNDB
SEL = 105.8 DB
SELT = 107.1 DB
THETA= 87.8 DEG

TABLE: SOUND PRESSURE LEVEL SPECTRA AS A FUNCTION OF SLANT DISTANCE (DB)*

AIR-TO-GROUND PROPAGATION

AIRCRAFT:	OPERATION:	METEOROLOGY:	IDENTIFICATION:
C-141	TAKEOFF POWER 1.90 EPR AIRSPEED = 250 KNOTS	TEMP = 59 F REL HUMID = 70 % DELTA N = 0.0 DB	OMEGA 10.3 A/C CODE: 027 OPS CODE: 103 PROFILE VER: W 15 MAR 82 PAGE H1

SLANT DISTANCE (FEET)	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
	FREQUENCY BAND NUMBER																							
200	93	91	93	104	107	108	101	105	105	106	104	105	104	104	103	104	103	104	111	107	100	100	97	95
250	91	89	91	102	105	105	99	103	103	104	102	103	102	102	101	102	101	102	108	104	96	98	94	92
315	89	87	89	99	103	104	97	101	101	102	100	101	100	100	99	100	98	99	106	102	95	95	91	88
400	87	85	87	97	101	102	95	99	93	100	98	99	98	98	97	97	96	97	104	99	93	92	87	84
500	85	83	85	95	99	100	93	97	97	96	96	97	95	95	95	95	94	95	101	96	90	88	83	79
630	83	81	83	93	97	97	91	95	95	96	94	95	93	93	93	93	92	92	98	93	87	85	79	73
800	81	79	81	91	95	95	89	93	93	93	91	92	91	91	90	90	89	89	96	90	83	81	74	67
1000	79	77	79	89	93	93	87	91	91	91	89	90	89	89	88	88	86	87	92<	87	79	76	68	59
1250	77	75	77	87	91	91	85	89	83	89	87	86	86	86	85	85	84	84	89	83	75	71	61	50
1600	75	73	75	85	89	89	83	87	87	87	85	86	84	84	83	83	81	80	85	78	70	65	53	39
2000	73	71	73	83	87	87	80	85	85	85	83	83	82	81	80	80	77	77	81	73	64	57	44	26
2500	71	69	71	81	85	85	78	82	82	82	80	81	79	78	77	76	74	73	76	67	58	49	32	10
3150	69	67	68	79	83	83	76	80	80	80	76	78	76	76	74	73	70	68	71	60	50	38	18	
4000	67	65	65	77	80	81	74	78	78	78	75	75	73	72	70	69	65	63	64	52	40	26	1	
5000	65	63	64	75	78	79	72	75	75	75	72	73	70	69	66	64	60	56	57	42	29	11		
6300	63	61	62	73	76	75	69	73	73	72	69	69	67	65	62	59	54	49	47	30	15			
8000	61	59	60	70	74	74	67	70	70	69	66	65	63	60	57	53	47	41	37	16				
10000	59	56	58	66	71	71	64	68	67	66	63	62	58	55	51	46	39	30	23					
12500	56	54	55	66	69	63	61	65	64	63	59	58	53	50	44	38	29	18	7					
16000	54	52	53	63	66	65	58	62	60	59	54	53	47	43	36	28	17	3						
20000	52	50	51	61	63	63	55	58	57	54	49	47	41	35	27	17	3							
25000	50	47	48	58	61	60	52	54	52	49	44	40	33	25	15	2								

* EXTRAPOLATED FROM MEAN VALUES FOR LEVEL FLIGHTS.
< BAND WHICH DETERMINES THE TONE CORRECTION (C).

TABLE: SINGLE EVENT NOISE AS A FUNCTION OF SLANT DISTANCE*

AIR-TO-GROUND PROPAGATION

IDENTIFICATION:

OMEGA 10.3

A/C CODE: 027
OPS CODE: 103
PROFILE VER: W
15 MAR 82
PAGE I1

AIRCRAFT: C-141

OPERATION: TAKEOFF POWER 1.90 EPR

AIRSPEED = 250 KNOTS

METEOROLOGY: TEMP = 59 F, REL HUMID = 70 %

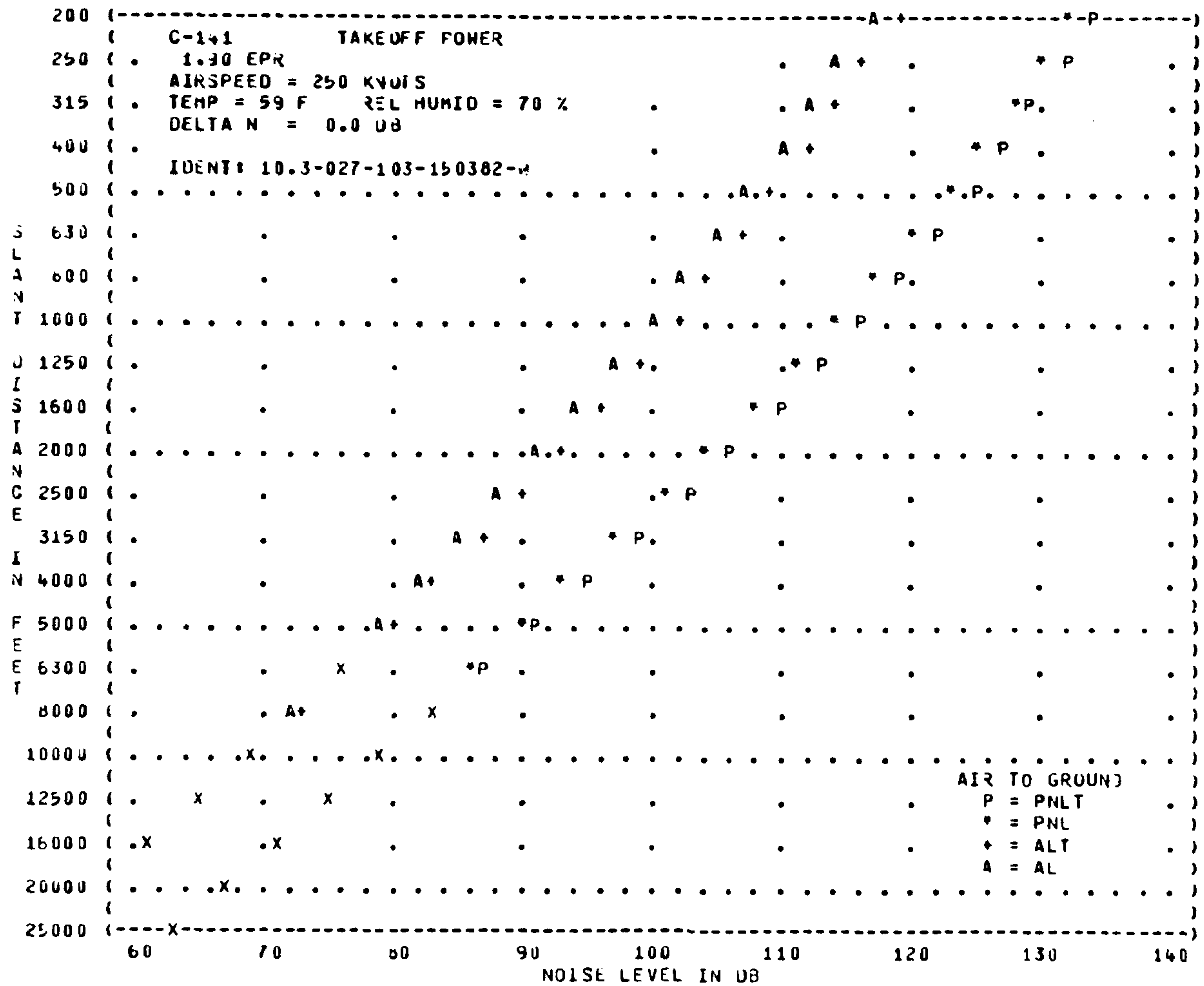
DELTA N = 0.0 DB

SLANT DISTANCE (FEET)	AL (DBA)	ALT** (DBA)	PNL (PNDB)	PNLT** (PNDB)	SEL (DB)	SELT** (DB)	EPNL** (EPNDB)
200	116.7	115.6	132.1	134.0	118.6	119.9	124.0
250	114.4	115.4	129.8	131.8	117.0	118.3	122.3
315	112.1	114.1	127.5	129.5	115.3	116.6	120.6
400	109.3	111.7	125.1	127.1	113.6	114.9	118.8
500	107.4	103.3	122.6	124.6	111.7	113.0	116.9
630	104.9	106.8	120.0	122.0	109.9	111.2	114.9
800	102.3	104.3	117.3	119.2	107.9	109.2	112.8
1000	99.7	101.6	114.4	116.3	105.8	107.1	110.5
1250	96.9	98.8	111.3	113.3	103.6	104.9	108.0
1600	94.0	96.0	108.0	110.0	101.4	102.7	105.3
2000	91.1	93.0	104.5	106.4	99.0	100.3	102.4
2500	88.1	90.0	100.7	102.6	96.6	97.9	99.2
3150	85.0	87.0	96.6	98.6	94.2	95.5	95.7
4000	82.0	83.5	93.0	94.5	91.7	92.7	92.4
5000	78.8	80.0	89.6	90.8	89.2	89.9	89.4
6300	75.6	75.4	86.2	86.9	86.5	87.0	86.3
8000	72.2	72.6	82.5	82.9	83.8	84.0	83.0
10000	68.8	69.8	78.8	78.8	80.9	80.9	79.6
12500	65.1	65.1	75.0	75.0	77.9	77.9	76.4
16000	61.4	61.4	71.0	71.0	74.7	74.7	73.0
20000	57.4	57.4	66.9	66.9	71.4	71.4	69.5
25000	53.3	53.3	62.6	62.6	67.8	67.8	65.8

* EXTRAPOLATED FROM MEAN VALUES FOR LEVEL FLIGHTS.
** BASED ON SMOOTHED TONE CORRECTION FUNCTION.

OMEGA 10.3

A/C CODE: 027
OPS CODE: 103
PROFILE VER: W
DATE: 15 MAR 82
PAGE J1



OMEGA 10.3

A/C CODE: 027
OPS CODE: 103
PROFILE VER: W
DATE: 15 MAR 82
PAGE K1

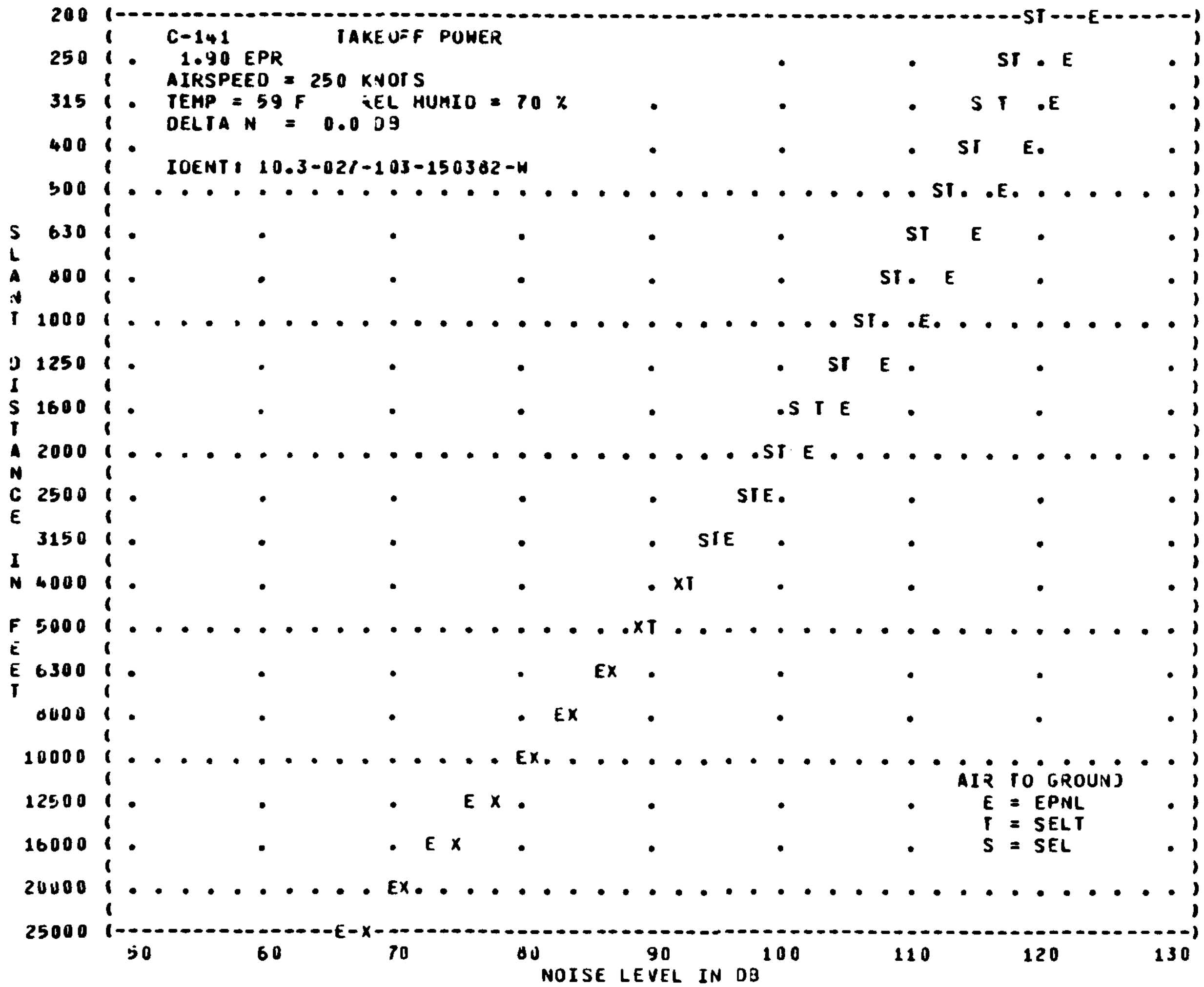


TABLE: SOUND PRESSURE LEVEL SPECTRA AS A FUNCTION OF SLANT DISTANCE (DB)*

GROUND-TO-GROUND PROPAGATION

IDENTIFICATION:
OMEGA 10.3
A/C CODE: 027
OPS CODE: 103
PROFILE VER: W
15 MAR 82
PAGE L1

AIRCRAFT: C-141

OPERATION: TAKEOFF POWER 1.90 EPR
AIRSPEED = 250 KNOTS

METEOROLOGY: TEMP = 59 F
REL HUMID = 70 %
DELTA N = 0.0 DB

SLANT DISTANCE (FEET)	FREQUENCY BAND NUMBER 17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
200	86	86	86	99	102	103	96	100	100	101	99	100	99	99	98	99	98	99	106	102	95	95	92	90
250	86	84	86	97	100	101	94	98	98	99	97	98	97	97	96	97	96	97	103	99	93	93	89	87
315	84	82	84	94	98	99	92	96	96	97	95	95	95	95	94	95	93	94	101	97	90	90	86	83
400	82	80	82	92	96	95	90	94	94	95	93	94	93	93	92	92	91	92	99	94	88	87	82	79
500	80	76	80	90	94	94	87	92	92	93	91	92	90	90	90	90	89	90	96	91	85	83	78	74
630	78	76	78	88	91	91	85	89	90	91	89	90	88	88	88	88	87	87	93	88	82	80	74	68
800	76	74	76	86	89	89	82	87	89	88	86	87	86	86	85	85	84	84	91	85	78	76	69	62
1000	74	72	74	83	86	85	79	84	86	86	84	85	84	84	83	83	81	82	87<	82	74	71	63	54
1250	72	70	71	80	83	82	76	80	83	84	82	83	81	81	80	80	79	79	84	78	70	66	56	45
1600	70	67	67	77	79	79	72	77	80	82	80	81	79	79	78	78	76	75	80	73	65	60	48	34
2000	67	64	64	73	75	75	68	73	76	80	78	78	77	76	75	75	72	72	76	68	59	52	39	21
2500	64	60	59	69	71	71	64	69	72	76	75	76	74	73	72	71	69	68	71	62	53	44	27	5
3150	60	55	55	64	66	66	59	64	68	72	72	73	71	71	69	68	65	63	66	55	45	33	13	
4000	55	50	49	58	60	60	53	58	63	67	68	70	58	67	65	64	60	58	59	47	35	21		
5000	50	45	45	53	56	55	49	53	57	62	64	66	63	64	61	59	55	51	52	37	24	6		
6300	45	41	40	49	51	51	44	48	51	56	59	61	51	60	57	54	49	44	42	25	10			
8000	43	39	36	46	49	49	41	45	48	53	56	58	57	55	52	48	42	36	32	11				
10000	41	36	36	44	46	45	39	43	45	50	53	54	52	50	46	41	34	25	18					
12500	38	34	33	42	44	43	36	40	42	47	49	50	47	45	39	33	24	13	2					
16000	36	32	31	39	41	40	33	37	38	43	44	45	41	38	31	23	12							
20000	34	30	29	37	38	33	30	33	35	38	39	39	35	30	22	12								
25000	32	27	26	34	36	34	26	29	30	33	34	32	27	20	10									

* EXTRAPOLATED FROM MEAN VALUES FOR LEVEL FLIGHTS.
< BAND WHICH DETERMINES THE TONE CORRECTION (C).

TABLE: SINGLE EVENT NOISE AS A FUNCTION OF SLANT DISTANCE*

GROUND-TO-GROUND PROPAGATION

IDENTIFICATION:
OMEGA 10.3
A/C CODE: 027
OPS CODE: 103
PROFILE VER: W
15 MAR 82
PAGE M1

AIRCRAFT: C-141

OPERATION: TAKEOFF POWER, 1.90 EPR

AIRSPEED = 250 KNOTS

METEOROLOGY: TEMP = 59 F, REL HUMID = 70 %

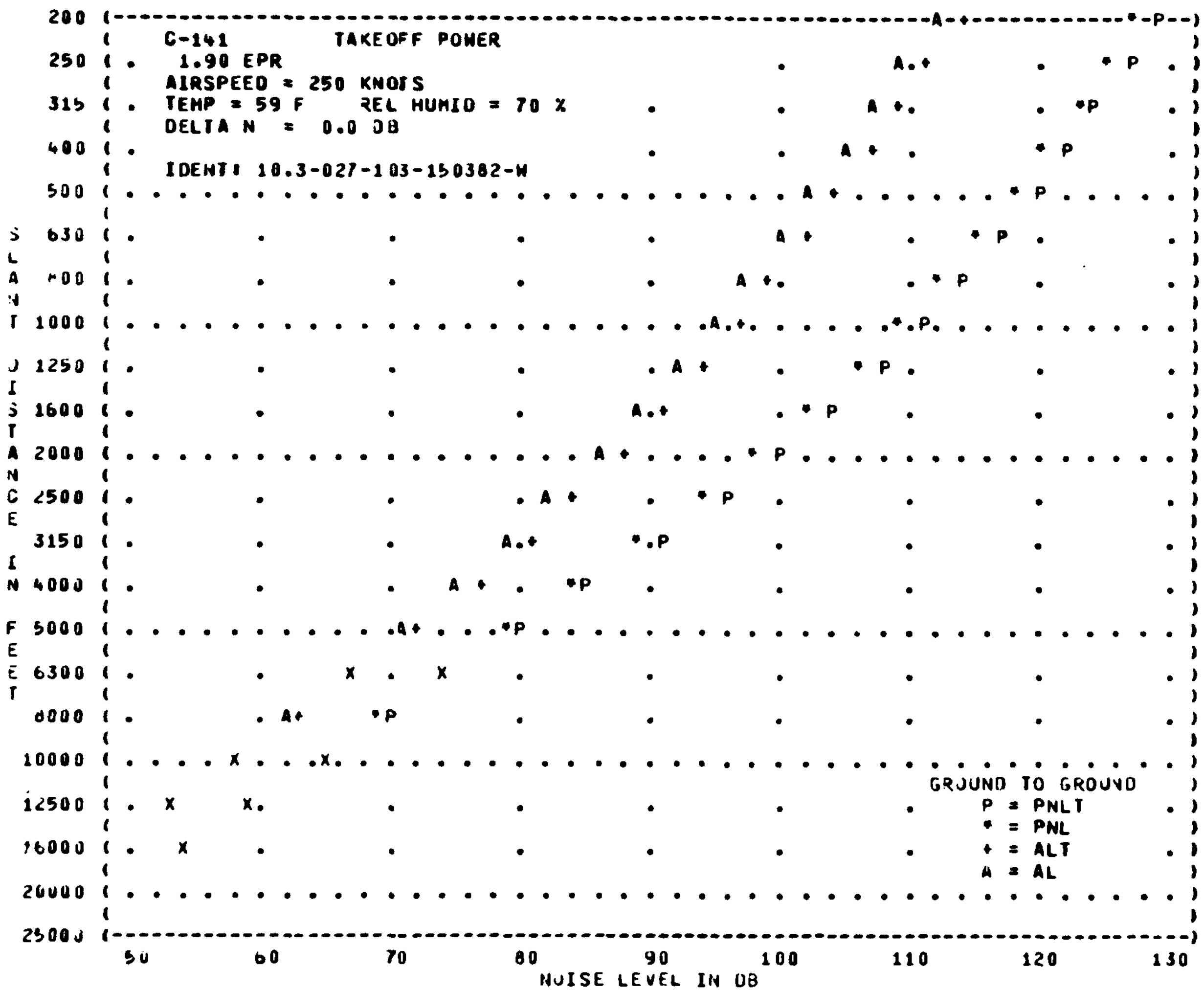
DELTA N = 0.0 DB

SLANT DISTANCE (FEET)	AL (DBA)	ALT** (DBA)	PNL (PNDB)	PNLT** (PNDB)	SEL (DB)	SELT** (DB)	EPNL** (EPNDB)
200	111.7	113.6	127.1	129.0	113.6	114.9	119.0
250	109.4	111.4	124.8	126.8	112.0	113.3	117.3
315	107.1	103.1	122.5	124.4	110.3	111.6	115.6
400	104.8	105.7	120.1	122.0	108.6	109.9	113.8
500	102.4	104.3	117.6	119.5	106.7	108.0	111.9
630	99.9	101.8	114.9	116.9	104.8	106.1	109.8
800	97.3	99.2	112.1	114.1	102.8	104.1	107.6
1000	94.6	95.5	109.1	111.1	100.7	102.0	105.2
1250	91.7	93.7	105.9	107.8	98.5	99.8	102.6
1600	88.8	90.7	102.4	104.3	96.1	97.4	99.7
2000	85.7	87.7	98.5	100.4	93.7	95.0	96.4
2500	82.4	84.4	94.2	96.1	91.0	92.3	92.7
3150	78.9	80.9	89.3	91.2	88.1	89.4	88.4
4000	75.2	75.7	83.8	85.4	84.9	85.9	83.3
5000	71.0	72.1	76.8	80.0	81.3	82.1	78.6
6300	66.5	67.3	73.7	74.4	77.5	78.0	73.8
8000	62.4	62.8	69.3	69.6	73.9	74.2	69.7
10000	57.9	57.9	64.6	64.6	70.0	70.0	65.4
12500	53.1	53.1	59.5	59.5	65.8	65.8	60.9
16000	47.8	47.8	53.8	53.8	61.2	61.2	55.8
20000	42.1	42.1	47.8	47.8	56.1	56.1	50.4
25000	36.0	36.0	40.6	40.6	50.5	50.5	43.8

* EXTRAPOLATED FROM MEAN VALUES FOR LEVEL FLIGHTS.
** BASED ON SMOOTHED TONE CORRECTION FUNCTION.

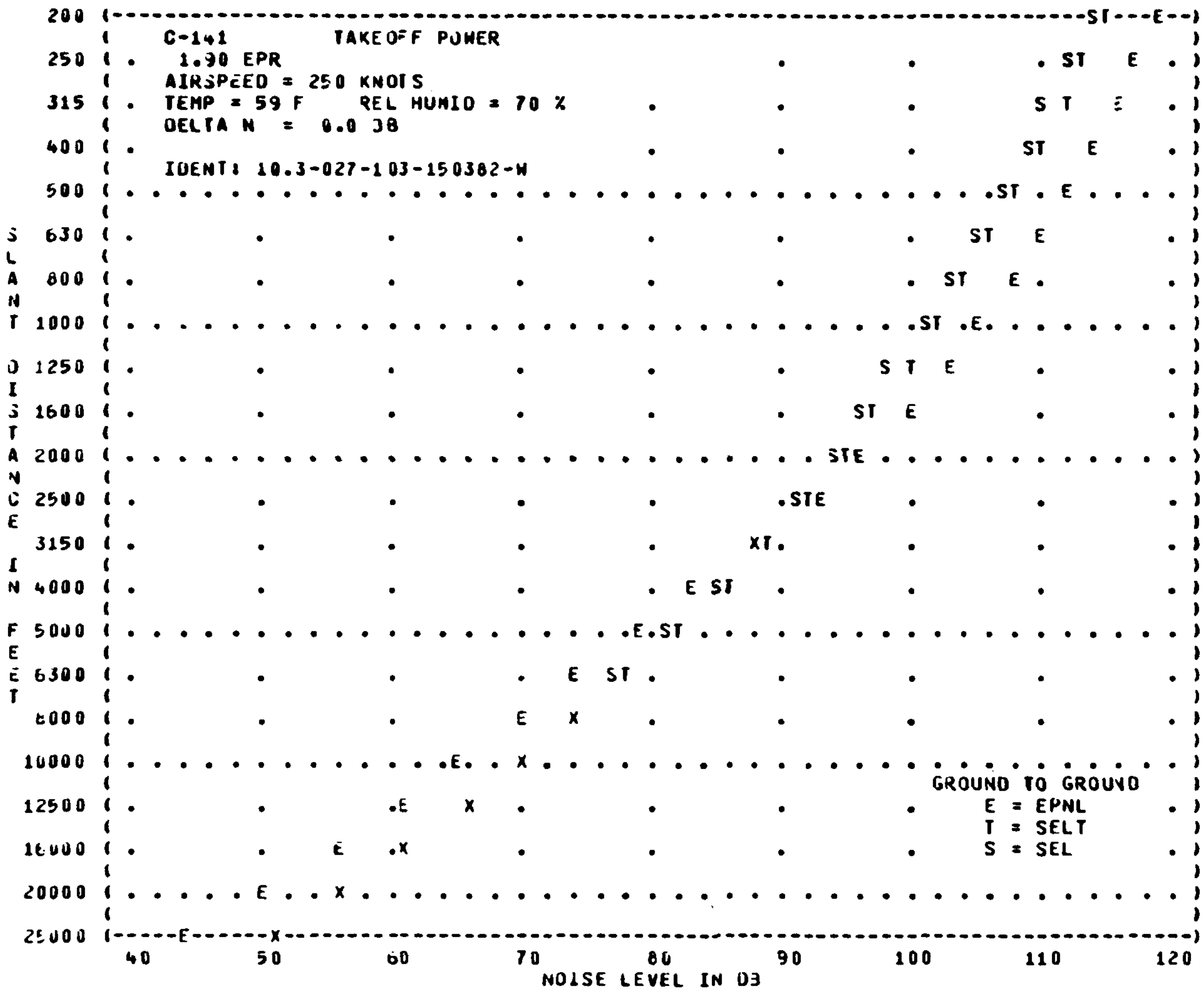
OMEGA 10.3

A/C CODE: 027
OPS CODE: 103
PROFILE VER: W
DATE: 15 MAR 82
PAGE N1



OMEGA 10.3

A/C CODE: 027
OPS CODE: 103
PROFILE VER: W
DATE: 15 MAR 82
PAGE 01



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SUMMARY OF I/O FOR AIRCRAFT: C-141

PROGRAM:  OMEGA 10.3
AIRCRAFT CODE: 027
PROFILE VERSION CODE: W
COMDECK REVISION IDENTIFIER: 0
DATE: 15 MAR 82
DELTA N (OR DELN) =  0.00 DB

********************************** INPUT DATA **********************************
 COMDECK          POWER    AIRSPEED POWER DESCRIPTION      DATE OF
   NAME   OPC   SETTING     KNOTS                          NORM. RUN
N02703180  03  1.90 EPR     250   TAKEOFF POWER           27 DEC 79

********************************** OUTPUT DATA **********************************
IS PROFILE DATA WRITTEN ON FILE "TAPE3"?--YES
MAXIMUM PERMITTED PROFILE DATA EXTRAPOLATION IS:  5.00 DB
ENGINE TYPE FOR ALL PROFILE DATA: TURBOFAN
METEOROLOGY:  TEMP      =   59 F
              REL HUMID =   70 %

PROFILE          POWER   AIRSPEED POWER DESCRIPTION           NORMALIZED COMDECKS
  ID     OPC    SETTING    KNOTS                          REFERENCE   SLOPE REF. POINTS
027031W0 03  1.90 EPR     250.0  TAKEOFF POWER            N02703180

***************************** GENERAL INFORMATION *****************************
OPC --- OPERATION POWER CODE.
THE ENGINE TYPE GIVEN ABOVE IS TAKEN FROM THE LAST REFERENCE FILE DATASET;
IT IS ASSUMED TO BE THE SAME FOR ALL DATASETS.
PROFILE COMDECK NAME = SYMBOL E, S OR L + PROFILE ID LISTED ABOVE
```

OMEGA 10 SAMPLE RUN PROFILE DATASET OUTPUT FILE (FILE TAPE3):

```
*COMDECK E027031W0
EPNL     027031         2   124.0   122.3   120.6   118.8   116.9   114.9C-141    1
COMMENT 027031W0 OMEGA10.3 15 MAR 82 C-141               250 KTS   59 F   70 PCT
COMMENT 027031W0 TURBOFAN              N02703180
COMMENT 027031W0 TAKEOFF POWER               1.90 EPR
          112.8   110.5   108.0   105.3   102.4    99.2    95.7    92.4C-141    2
           89.4    86.3    83.0    79.6    76.4    73.0    69.5    65.8C-141    3
         027031       1   119.0   117.3   115.6   113.8   111.9   109.8C-141    4
          107.6   105.2   102.6    99.7    96.4    92.7    88.4    83.3C-141    5
           78.6    73.6    69.7    65.4    60.9    55.8    50.4    43.8C-141
*COMDECK S027031W0
SELT     027031         2   119.9   118.3   116.6   114.9   113.0   111.2C-141    1
COMMENT 027031W0 OMEGA10.3 15 MAR 82 C-141               250 KTS   59 F   70 PCT
COMMENT 027031W0 TURBOFAN              N02703180
COMMENT 027031W0 TAKEOFF POWER               1.90 EPR
          109.2   107.1   104.9   102.7   100.3    97.9    95.5    92.7C-141    2
           89.9    87.0    84.0    80.9    77.9    74.7    71.4    67.8C-141    3
         027031       1   114.9   113.3   111.6   109.9   108.0   106.1C-141    4
          104.1   102.0    99.8    97.4    95.0    92.3    89.4    85.9C-141    5
           82.1    78.0    74.2    70.0    65.8    61.2    56.1    50.5C-141
*COMDECK L027031W0
SEL      027031         2   118.6   117.0   115.3   113.6   111.7   109.9C-141    1
COMMENT 027031W0 OMEGA10.3 15 MAR 82 C-141               250 KTS   59 F   70 PCT
COMMENT 027031W0 TURBOFAN              N02703180
COMMENT 027031W0 TAKEOFF POWER               1.90 EPR
          107.9   105.8   103.6   101.4    99.0    96.6    94.2    91.7C-141    2
           89.2    86.5    83.8    80.9    77.9    74.7    71.4    67.9C-141    3
         027031       1   113.6   112.0   110.3   108.6   106.7   104.8C-141    4
          102.6   100.7    98.5    96.1    93.7    91.0    88.1    84.9C-141    5
           81.3    77.5    73.9    70.0    65.8    61.2    56.1    50.5C-141
```

APPENDIX D
OMEGA 11 SAMPLE PROBLEM

This sample problem for the OMEGA 11 program inputs the reference file ground run-up noise normalized data for the T-38A aircraft from the NOISEFILE 4 database and interpolates profile data for the power settings requested on the code sheet. The following items are included in this Appendix:

(1) The completed OMEGA 11 program code sheets.

(2) A listing of the code sheet and reference file input data.

(3) The tab output for this sample problem.

(4) A listing of the ground run-up noise profile datasets written on file TAPE2.

OMEGA 11 PROGRAM CODE SHEET

I. JOB CONTROL CARD (One Per Job):

COL.	Entry	Parameter
1	1 5 b M A R b 8 2	DATE; eg. 12 APR 77
12	1	IPR [0]
13	0	IEDIT [0]
16	____	MEAS(1) PNLT [0]
18	____	MEAS(2) AL [0]
20	____	MEAS(3) ALT [0]
21	_ 3 _ 5	FMXER [5.0 dB]

II. OUTPUT PARAMETERS FOR EACH AIRCRAFT (2 Cards):

Card #1

COL.	Entry	Parameter
1	0 3 3	ACC
8	_ 7 0	IT8 [59]
11	2 9 . 5 0	P8 [29.92]
18	_ 6 0	IH8 [70]
22	____	PV [W]
24	____	CRI [0]
26	_ _ 2 _ 0	DELN [0.0]

Card #2 (Profile Output Power Data)

COL.	Entry	Parameter	COL.	Entry	Parameter	COL.	Entry	Parameter
1	3	NP						
2	% . R P M _	PSU (LEFT JUSTIFY)						
11	_ _ 1 0 0	PSC #1	17	1	IFC	19	9 5	OPCC[91]
21	_ _ _ 5 0	PSC #2	27	___	IFC	29	9 6	OPCC[92]
31	_ _ 1 0 0	PSC #3	37	___	IFC	39	9 7	OPCC[93]
41	______	PSC #4	47	___	IFC	49	___	OPCC[94]
51	______	PSC #5	57	___	IFC	59	___	OPCC[95]
61	______	PSC 6	67	___	IFC	69	___	OPCC[96]

(RIGHT JUSTIFY "PSC" DATA)

2nd AIRCRAFT

Card #1

COL.	Entry	Parameter
1	____	ACC
8	____	IT8 [59]
11	______	P8 [29.92]
18	____	IH8 [70]
22	____	PV [W]
24	____	CRI [0]
26	______	DELN [0.0]

Card #2

COL.	Entry	Parameter	COL.	Entry	Parameter	COL.	Entry	Parameter
1	____	NP						
2	______	PSU (LEFT JUSTIFY)						
11	______	PSC #1	17	___	IFC	19	___	OPCC[91]
21	______	PSC #2	27	___	IFC	29	___	OPCC[92]
31	______	PSC #3	37	___	IFC	39	___	OPCC[93]
41	______	PSC #4	47	___	IFC	49	___	OPCC[94]
51	______	PSC #5	57	___	IFC	59	___	OPCC[95]
61	______	PSC #6	67	___	IFC	69	___	OPCC[96]

(RIGHT JUSTIFY "PSC" DATA)

III. TERMINATE SETUP DECK WITH AN "END OF RECORD" OR "END OF JOB" CARD

(1) Repeat section II, cards 1 and 2 for each aircraft set in the job.
(2) [ ] -- Program default values for above parameters.
(3) See Standard Procedure for Setup and Execution of the OMEGA 11 Program for parameter definitions.

OMEGA 11 CODE SHEET INPUT FILE:

```
15 MAR 82  1 0        3.5
033      7029.50   60        2.0
3% RPM       100 1 95   50   96  100   97
```

OMEGA 11 REFERENCE FILE INPUT DATA (FILE TAPE7):

```
COMMENT 03303A0 OMEGA 8.2 17 FEB 76  59 F  70 PCT  29.92 IN HG   74-004-029 04
COMMENT 03303A0 T-38A      AIRCRAFT          ENG. J85-GE-5A
COMMENT 03303A0  MAX PWR A/B                100 % RPM
087+00402904  1    0 807 822 842 872 880 895 862 867 862 867 890 856 798 838 793
087+00402904  2    0 802 797 789 744 812 726 728 800 676
087+00402904  1   10 822 825 840 862 867 897 887 870 860 865 905 858 828 848 821
087+00402904  2   10 819 807 814 777 844 768 763 833 704
087+00402904  1   20 810 825 842 865 895 907 900 882 862 902 915 876 856 818 831
087+00402904  2   20 837 814 819 777 829 758 753 828 696
087+00402904  1   30 812 842 850 882 895 915 900 885 900 922 927 886 891 846 851
087+00402904  2   30 854 827 834 804 822 771 770 833 719
087+00402904  1   40 837 852 850 872 902 922 910 900 915 937 962 928 911 893 878
087+00402904  2   40 889 864 864 837 839 806 788 798 714
087+00402904  1   50 845 860 870 905 915 935 922 922 922 940 962 918 918 896 898
087+00402904  2   50 904 879 869 847 854 826 808 803 739
087+00402904  1   60 837 867 887 905 930 945 937 925 930 955 980 946 928 911 886
087+00402904  2   60 834 872 857 817 834 801 783 795 719
087+00402904  1   70 845 860 887 917 942 972 962 952 940 9651002 981 948 963 946
087+00402904  2   70 917 922 917 897 899 861 843 818 766
087+00402904  1   80 830 870 887 927 945 955 952 937 945 980 997 946 956 931 943
087+00402904  2   80 919 922 902 887 877 836 815 803 746
087+00402904  1   90 857 885 902 942 965 985 970 967 97510101032 983 993 976 991
087+00402904  2   90 964 974 952 929 922 883 845 810 771
087+00402904  1  100 862 890 920 952 99710121000 990 992103010651046101310311003
087+00402904  2  100 964 932 927 942 952 911 865 850 811
087+00402904  1  110 885 917 952 990103010451047105210471090110210661083105 61071
087+00402904  2  11010321029 1007 969 977 956 935 918 871
087+00402904  1  120 942 9801017106010971102110511271130114511901163109811131068
087+00402904  2  1201074104910271012 999 968 940 920 884
087+00402904  1  130 9751022104711051140114711201097115211621192116111171123 1101
087+00402904  2  1301094107410371022 10321013 983 975 944
087+00402904  1  14010101040106510951127114011151097110211601180112811211078 1051
087+00402904  2  14010391009 992 989 987 956 910 868 856
087+00402904  1  150 98810171035106510921112110710871077109511121078105310431003
087+00402904  2  1501004 972 912 889 873 851 820 793 734
087+00402904  1  160 845 842 817 815 820 832 825 807 805 790 790 708 733 716 708
087+00402904  2  160 809 804 854 532 629 588 590 555 489
087+00402904  1  170 775 775 775 782 792 797 787 765 762 757 760 733 706 688 678
087+00402904  2  170 674 667 649 524 622 581 570 538 469
087+00402904  1  180 703 705 732 752 757 762 747 725 720 717 730 698 673 663 656
087+00402904  2  180 659 652 644 519 512 573 550 518 449
COMMENT 03304A0 OMEGA 8.2 17 FEB 76  59 F  70 PCT  29.92 IN HG   74-004-029 03
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COMMENT 03304A0 T-38A      AIRCRAFT         ENG. J85-GE-5A
COMMENT 03304A0  MIL PWR                    100 % RPM
087400402903  1    0 705 724 742 772 775 810 800 785 765 810 840 811 793 801 811
087400402903  2    0 794 799 789 757 812 731 730 788 676
087400402903  1   10 718 729 737 767 787 822 830 812 815 852 862 866 831 846 836
087400402903  2   10 829 832 817 789 794 736 725 713 639
087400402903  1   20 700 732 755 782 802 840 827 817 822 867 890 846 868 861 861
087400402903  2   20 847 852 849 824 824 783 765 740 671
087400402903  1   30 724 750 770 785 802 832 837 822 832 857 882 878 856 866 866
087400402903  2   30 857 869 857 837 834 801 788 770 694
087400402903  1   40 737 772 760 787 805 845 840 832 855 875 902 873 876 866 876
087400402903  2   40 864 872 852 842 837 801 783 755 694
087400402903  1   50 726 748 765 795 820 842 837 842 855 865 887 861 871 866 878
087400402903  2   50 884 882 879 857 857 831 818 795 739
087400402903  1   60 732 750 787 810 825 860 870 850 857 882 910 911 881 893 886
087400402903  2   60 899 897 889 869 874 851 833 810 749
087400402903  1   70 755 764 797 832 852 875 882 860 867 900 932 891 908 898 913
087400402903  2   70 892 899 897 879 882 856 833 800 749
087400402903  1   80 770 790 802 832 862 892 887 880 895 925 940 898 923 906 926
087400402903  2   80 919 927 927 904 904 881 863 838 781
087400402903  1   90 775 795 817 855 875 915 900 890 920 955 965 921 961 923 938
087400402903  2   90 914 919 902 879 879 856 835 815 791
087400402903  1  100 777 812 822 855 897 930 917 915 940 965 980 955 978 958 958
087400402903  2  100 944 954 942 922 929 888 863 835 809
087400402903  1  110 812 842 860 890 920 955 957 942 965 9971015 9831013 986 996
087400402903  2  110 969 974 964 917 914 891 860 840 824
087400402903  1  120 840 880 905 940 9571000101010071017105210671033104610111021
087400402903  2  12010091009 1002 972 969 946 928 910 869
087400402903  1  130 887 920 955 9921012103210371057109210301122107110881046 1023
087400402903  2  130 957 937 949 942 952 888 865 848 796
087400402903  1  140 920 952 965102210601090105510071045106510821033105810311026
087400402903  2  1401007 987 957 909 884 863 855 830 774
087400402903  1  150 920 950 972 995 99710271002 99210021020 1005 956 951 903 893
087400402903  2  150 857 849 842 802 794 768 748 733 671
087400402903  1  160 842 857 840 852 870 887 845 835 852 845 855 833 823 811 793
087400402903  2  160 754 757 732 597 697 663 650 623 576
087400402903  1  170 810 758 724 733 760 762 735 730 775 772 775 768 748 706 696
087400402903  2  170 667 662 644 514 612 578 565 533 481
087400402903  1  180 797 770 750 709 719 727 724 705 715 720 725 703 673 648 646
087400402903  2  180 624 614 594 572 564 528 535 495 430
COMMENT 03313A0 OMEGA 8.2 17 FEB 76  59 F  70 PCT  29.92 IN HG   74-004-029 01
COMMENT 03313A0 T-38A      AIRCRAFT         ENG. J85-GE-5A
COMMENT 03313A0  IDLE                       48 % RPM
087400402901  1    0 675 649 535 655 683 705 678 611 637 625 635 606 578 596 608
087400402901  2    0 687 672 627 627 807 671 663 773 646
087400402901  1   10 673 646 643 550 683 717 663 627 670 680 657 611 626 593 596
087400402901  2   10 659 652 634 537 809 676 575 775 641
087400402901  1   20 668 666 648 566 700 737 609 645 650 657 665 533 593 591 593
087400402901  2   20 677 677 657 647 792 683 685 785 679
087400402901  1   30 688 664 652 561 685 732 696 633 655 687 660 615 596 591 616
087400402901  2   30 604 679 632 514 774 693 590 793 684
087400402901  1   40 702 686 652 535 665 732 694 645 702 702 667 601 511 593 613
087400402901  2   40 667 692 649 519 762 683 680 785 676
087400402901  1   50 696 686 692 506 669 730 503 650 692 667 522 573 601 591 613
087400402901  2   50 662 664 612 612 669 626 653 733 614
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087+00402901  1    60 694 670 668 568 685 752 715 656 687 667 647 598 616 581 576
087+00402901  2    60 647 652 552 582 727 661 525 733 631
087+00402901  1    70 696 683 657 668 702 755 712 666 692 687 650 601 596 566 556
087+00402901  2    70 607 587 552 564 712 641 610 720 614
087+00402901  1    80 694 686 664 563 700 752 712 659 695 695 657 598 606 556 546
087+00402901  2    80 589 564 527 517 659 576 548 648 549
087+00402901  1    90 712 692 664 679 715 765 730 675 715 715 695 628 608 581 548
087+00402901  2    90 577 554 519 589 622 546 545 638 529
087+00402901  1   100 717 702 660 686 727 767 735 685 712 715 705 663 621 611 581
087+00402901  2   100 534 562 539 509 609 538 533 625 521
087+00402901  1   110 710 702 670 695 715 760 710 677 705 730 720 668 656 626 613
087+00402901  2   110 622 607 589 572 677 593 593 670 551
087+00402901  1   120 683 697 631 598 715 737 725 697 715 720 722 698 688 661 643
087+00402901  2   120 652 632 627 512 637 606 593 633 559
087+00402901  1   130 717 710 683 716 740 762 717 687 712 720 707 686 661 641 618
087+00402901  2   130 669 647 672 647 689 646 638 705 581
087+00402901  1   140 722 720 702 732 760 770 730 666 660 710 692 615 628 593 591
087+00402901  2   140 654 642 662 632 699 636 620 663 566
087+00402901  1   150 715 702 678 698 730 747 715 687 687 690 637 605 623 588 611
087+00402901  2   150 682 672 684 549 772 648 618 688 584
087+00402901  1   160 691 655 630 535 615 625 613 600 588 647 562 539 561 531 533
087+00402901  2   160 614 604 607 582 699 596 575 640 531
087+00402901  1   170 657 639 620 502 583 565 546 528 509 491 462 433 405 391 412
087+00402901  2   170 502 502 507 474 604 498 475 543 434
087+00402901  1   180 685 670 615 505 594 584 568 552 536 520 479 465 452 423 446
087+00402901  2   180 527 509 522 474 567 491 483 543 449
COMMENT 03321A0 OMEGA 8.2 17 FEB 76   59 F  70 PCT  29.92 IN HG   74-004-029 02
COMMENT 03321A0 T-38A      AIRCRAFT          ENG. J85-GE-5A
COMMENT 03321A0  70 % RPM ENG RUNUP          70 % RPM
087+00402902  1     0 670 655 641 644 680 745 717 656 606 660 642 606 613 601 603
087+00402902  2     0 657 687 667 557 724 831 683 718 736
087+00402902  1    10 652 640 624 526 665 735 705 635 620 697 655 601 626 601 611
087+00402902  2    10 632 672 672 552 727 808 673 720 744
087+00402902  1    20 662 649 635 635 694 765 750 654 645 680 687 636 621 601 603
087+00402902  2    20 669 659 692 672 739 831 690 733 761
087+00402902  1    30 678 664 648 644 689 760 742 664 640 695 682 623 621 611 623
087+00402902  2    30 627 657 649 529 714 805 680 638 731
087+00402902  1    40 691 688 652 652 685 775 745 677 665 690 680 626 618 621 621
087+00402902  2    40 642 697 684 557 697 788 570 635 729
087+00402902  1    50 668 643 632 641 680 752 737 680 640 647 645 595 601 608 626
087+00402902  2    50 642 684 652 659 682 751 653 658 714
087+00402902  1    60 675 666 654 668 696 795 780 690 655 697 690 621 626 616 611
087+00402902  2    60 632 662 657 544 677 771 668 660 711
087+00402902  1    70 685 678 673 668 715 795 777 690 672 682 670 608 608 603 603
087+00402902  2    70 597 632 604 592 622 726 630 603 656
087+00402902  1    80 696 688 654 566 707 795 770 692 672 697 665 613 596 593 566
087+00402902  2    80 544 552 552 552 589 708 610 573 619
087+00402902  1    90 702 681 652 566 710 785 745 656 655 667 660 588 591 578 558
087+00402902  2    90 539 562 552 527 577 681 573 553 579
087+00402902  1   100 700 681 657 663 715 785 705 685 680 700 687 608 618 608 601
087+00402902  2   100 507 564 543 522 559 600 555 578 576
087+00402902  1   110 705 594 691 598 757 812 777 732 712 745 750 585 688 676 646
087+00402902  2   110 602 532 569 562 592 650 570 606 601
087+00402902  1   120 725 720 707 711 750 812 795 740 722 755 765 736 718 713 691
087+00402902  2   120 654 642 624 604 614 641 505 650 629
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087+00402902	1	130	732	728	710	737	777	812	772	722	750	757	745	691	731	683	661
087+00402902	2	130	694	692	664	652	669	698	643	638	671						
087+00402902	1	140	715	720	691	730	770	810	765	680	702	730	725	630	671	626	616
087+00402902	2	140	672	652	667	694	702	696	636	633	664						
087+00402902	1	150	715	706	678	714	747	602	765	710	702	702	692	611	641	601	611
087+00402902	2	150	694	702	727	677	717	696	650	658	706						
087+00402902	1	160	680	664	643	677	702	745	702	656	670	685	697	623	638	623	636
087+00402902	2	160	709	712	732	702	757	738	683	673	684						
087+00402902	1	170	654	638	616	600	582	565	547	529	511	493	475	453	431	415	428
087+00402902	2	170	522	534	547	504	562	561	503	503	526						
087+00402902	1	180	670	645	594	604	615	625	591	556	521	487	492	453	414	394	412
087+00402902	2	180	487	477	499	459	512	516	470	478	526						

NOISE PRODUCED ON THE GROUND BY

T-38A AIRCRAFT

DURING GROUND RUN-UP OPERATIONS

TEST 74-004-029
AIRCRAFT CODE: 033
PROFILE VERSION: W
COMPUTER PROGRAM OMEGA 11.1

15 MAR 82

A E R O S P A C E   M E D I C A L   R E S E A R C H   L A B O R A T O R Y
W R I G H T - P A T T E R S O N   A I R   F O R C E   B A S E ,   O H I O

SUMMARY OF I/O FOR TEST 74-004-029 FOR THE T-38A AIRCRAFT

PROGRAM: OMEGA 11.1
AIRCRAFT CODE: 033
PROFILE VERSION CODE: W
COMDECK REVISION IDENTIFIER: 0
DATE: 15 MAR 82
DELTA N (OR DELN)= 2.00 DB

****************************** INPUT DATA ******************************

COMDECK NAME	OPC	FLAG IFI	POWER SETTING	TEST NO	RUN NO	POWER DESCRIPTION
N03303A0	03	1	100 % RPM	74-004-029	04	MAX PWR A/B
N03304A0	04	0	100 % RPM	74-004-029	03	MIL PWR
N03313A0	13	0	48 % RPM	74-004-029	01	IDLE
N03321A0	21	0	70 % RPM	74-004-029	02	70 % RPM ENG RUNUP

COMDECK NAME	NOISE SOURCE/SUBJECT PART 1		NOISE SOURCE/SUBJECT PART 2	DATE OF NORM. RUN
N03303A0	T-38A	AIRCRAFT	ENG. J85-GE-5A	17 FEB 76
N03304A0	T-38A	AIRCRAFT	ENG. J85-GE-5A	17 FEB 76
N03313A0	T-38A	AIRCRAFT	ENG. J85-GE-5A	17 FEB 76
N03321A0	T-38A	AIRCRAFT	ENG. J85-GE-5A	17 FEB 76

****************************** OUTPUT DATA ******************************
MEASURES COMPUTED: PNLT(P)--YES AL(A)--YES ALT(T)--YES
ANGLE SELECTION MODE: PROFILE DATA FOR 10 ANGLES WRITTEN ON FILE 'TAPE2'
MAX ERROR PERMITTED IN PROFILE DATA ANGLE SELECTION (FILE TAPE2)= 3.5 DB
METEOROLOGY: TEMP = 70 F
BAR PRESS = 29.50 IN HG
REL HUMID = 60 %

TEST NUMBER FOR ALL RUNS: 74-004-029
NOISE SOURCE/SUBJECT FOR ALL RUNS, PART 1: T-38A AIRCRAFT
PART 2: ENG. J85-GE-5A

PROFILE ID	OPC	RUN NO	POWER SETTING	NORMALIZED COMDECKS FIRST	NORMALIZED COMDECKS SECOND	POWER DESCRIPTION
03395W0	95	01	100 % RPM	N03303A0		MAX PWR A/B
03396W0	96	02	50 % RPM	N03313A0	N03321A0	
03397W0	97	03	100 % RPM	N03304A0		MIL PWR

************************** GENERAL INFORMATION **************************
OPC --- OPERATION POWER CODE
FLAG IFI=1 --- REFERENCE DATA ARE FOR AFTERBURNER, WET OR WITH JETS
IFI=0 --- NORMAL REFERENCE DATA WHICH CAN BE INTERPOLATED
PROFILE COMDECK NAME = SYMBOL P, A OR T + PROFILE ID LISTED ABOVE

TABLE: NORMALIZED SOUND PRESSURE LEVEL (DB)
1/3 OCTAVE BAND
DISTANCE = 250 FEET

IDENTIFICATION:
OMEGA 11.1
TEST 74-004-029
RUN
AIRCRAFT CODE 033
OPERATION CODE 03
PROFILE VERSION W
15 MAR 82
PAGE C1

NOISE SOURCE/SUBJECT:
T-38A AIRCRAFT
ENG. J85-GE-5A

OPERATION:
MAX PWR A/B
100 % RPM

METEOROLOGY:
TEMP = 59 F
BAR PRESS =29.92 IN HG
REL HUMID = 70 %
DELTA N = 2.0 DB

BAND CENTER FREQ (HZ)	ANGLE (DEGREES) 0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
50	83	84	83	83	86	87	86	87	85	88	88	91	96	100	103	100	87	80	72
63	84	85	85	86	87	88	89	88	89	91	91	94	100	104	106	104	86	80	73
80	86	86	86	87	87	89	91	91	91	92	94	97	104	107	109	106	84	80	75
100	89	88	89	90	89	93	93	94	95	96	97	101	108	113	112	109	84	80	77
125	90	89	92	92	92	94	95	96	97	99	102	105	112	116	115	111	84	81	78
160	92	92	93	94	94	95	97	99	98	101	103	107	112	117	116	113	85	82	78
200	90	91	92	92	93	94	96	98	97	99	102	107	113	114	114	113	85	81	77
250	89	89	90	91	92	94	95	97	95	99	101	107	115	112	112	111	83	79	75
315	87	88	90	92	94	94	95	96	97	100	101	107	115	117	112	110	83	78	74
400	89	91	92	94	96	96	98	99	100	103	105	111	117	120	118	112	81	78	74
500	91	93	94	95	98	98	100	102	102	105	109	112	121	121	120	113	81	78	75
630	88	88	90	91	95	94	97	100	97	100	107	109	118	118	115	110	79	75	72
800	82	85	88	91	93	94	95	97	98	101	103	110	112	119	114	107	75	73	70
1000	86	87	84	87	91	92	93	96	95	100	105	108	113	114	110	106	74	71	68
1250	81	84	85	87	90	92	91	97	95	101	102	109	109	112	107	102	73	70	68
1600	82	84	86	87	91	92	91	94	94	98	98	105	103	111	106	102	71	69	68
2000	82	83	83	85	88	90	89	94	94	99	95	105	107	109	103	99	70	69	67
2500	81	83	84	85	88	89	88	94	92	97	95	103	105	106	101	93	67	67	66
3150	76	80	80	82	86	87	84	92	91	95	96	99	103	104	101	91	65	64	64
4000	83	86	85	84	86	87	85	92	90	94	97	100	102	105	101	90	65	64	63
5000	75	79	76	79	83	85	82	88	86	90	93	98	93	103	98	87	61	60	59
6300	75	78	77	79	81	83	80	86	84	87	89	96	96	100	93	84	61	59	57
8000	82	85	85	85	82	82	82	84	82	83	87	94	94	100	91	81	58	56	54
10000	70	72	72	74	73	76	74	79	77	79	83	89	90	96	88	75	51	49	47
OVERALL	100	101	102	103	105	106	107	110	109	112	115	120	126	128	126	122	95	91	87

TABLE: NORMALIZED SOUND PRESSURE LEVEL (DB)
1/3 OCTAVE BAND
DISTANCE = 250 FEET

IDENTIFICATION:
OMEGA 11.1
TEST 74-004-029
RUN
AIRCRAFT CODE 033
OPERATION CODE 04
PROFILE VERSION W
15 MAR 82
PAGE C2

NOISE SOURCE/SUBJECT:
T-38A AIRCRAFT
ENG. J85-GE-5A

OPERATION:
MIL PWR
100 % RPM

METEOROLOGY:
TEMP = 59 F
BAR PRESS =29.92 IN HG
REL HUMID = 70 %
DELTA N = 2.0 DB

BAND CENTER FREQ (HZ)	ANGLE (DEGREES) 0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
50	73	74	72	74	76	75	75	78	79	80	80	83	86	91	94	94	86	83	82
63	74	75	75	77	79	77	77	78	81	82	83	86	90	94	97	97	88	78	79
80	76	76	78	79	78	79	81	81	82	84	84	88	93	98	99	99	86	74	77
100	79	79	80	81	81	82	83	85	85	88	88	91	96	101	104	102	87	75	73
125	80	81	82	82	83	84	85	87	88	90	92	94	98	103	108	102	89	78	74
160	83	84	86	85	87	85	68	90	91	94	95	98	102	105	111	105	91	78	75
200	82	85	85	66	86	85	83	90	91	92	94	98	103	106	108	102	87	76	74
250	81	83	84	84	85	86	87	88	90	91	94	96	103	108	103	101	86	75	73
315	81	84	84	85	88	88	68	89	92	94	96	99	104	111	107	102	87	80	74
400	83	87	89	88	90	89	90	92	95	98	99	102	107	111	111	104	87	79	74
500	86	90	91	90	92	91	93	95	96	99	100	104	109	114	110	103	88	80	75
630	83	89	87	90	89	88	93	91	92	94	98	100	105	109	105	98	85	79	72
800	81	85	89	88	90	89	90	93	94	98	100	103	107	111	108	97	84	77	69
1000	82	87	88	89	89	89	91	92	93	94	98	101	103	107	105	92	83	73	67
1250	83	86	86	89	90	90	91	93	95	96	98	102	104	104	105	91	81	72	67
1600	81	85	87	88	88	90	92	91	94	93	96	99	103	98	103	88	77	69	64
2000	82	85	88	89	89	90	92	92	95	94	97	99	103	96	101	87	78	68	63
2500	81	84	87	88	88	90	91	92	95	92	96	98	102	97	98	86	75	66	61
3150	78	81	84	86	86	88	89	90	92	90	94	94	93	96	93	82	72	63	59
4000	83	81	84	85	86	88	69	90	92	90	95	93	93	97	90	81	72	63	58
5000	75	76	80	82	82	85	87	88	90	88	91	91	97	91	88	79	68	60	55
6300	75	75	79	81	80	84	85	85	88	86	88	88	95	89	88	77	67	59	56
8000	81	73	76	79	78	82	63	62	86	84	86	66	93	87	85	75	64	55	52
10000	70	66	69	71	71	76	77	77	80	81	83	84	83	82	79	69	60	50	45
OVERALL	95	98	99	100	101	101	103	104	106	107	109	112	116	120	119	113	99	90	87

TABLE: NORMALIZED SOUND PRESSURE LEVEL (DB)
1/3 OCTAVE BAND
DISTANCE = 250 FEET

IDENTIFICATION:
OMEGA 11.1
TEST 74-004-029
RUN
AIRCRAFT CODE 033
OPERATION CODE 13
PROFILE VERSION N
15 MAR 82
PAGE C3

NOISE SOURCE/SUBJECT:
T-38A AIRCRAFT
ENG. J85-GE-5A

OPERATION:
IDLE
48 % RPM

METEOROLOGY:
TEMP = 59 F
BAR PRESS =29.92 IN HG
REL HUMID = 70 %
DELTA N = 2.0 DB

BAND CENTER FREQ (HZ)	ANGLE (DEGREES) 0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
50	70	69	69	71	72	72	71	72	71	73	74	73	70	74	74	74	71	68	71
63	67	67	65	68	71	71	69	70	71	71	72	72	72	73	74	72	68	66	69
80	66	66	67	67	67	67	69	68	68	68	70	69	71	70	72	70	65	64	64
100	68	67	69	68	66	69	69	69	68	70	71	72	72	74	75	72	66	62	63
125	70	70	72	71	71	71	71	72	72	74	75	74	74	76	78	75	64	60	61
160	73	74	75	75	75	75	77	76	77	79	79	78	76	78	79	77	65	59	60
200	70	68	71	72	71	70	74	73	73	75	76	73	75	74	75	74	63	57	59
250	63	65	67	65	67	67	68	69	68	70	71	70	72	71	69	71	62	55	57
315	66	69	67	68	72	71	71	71	72	74	73	73	74	73	70	71	61	53	56
400	65	70	66	71	72	69	69	71	72	74	74	75	74	74	73	71	67	51	54
500	66	68	63	68	69	64	67	67	68	72	73	74	74	73	71	66	58	48	50
630	63	63	65	64	62	59	62	62	62	65	68	69	72	71	64	63	56	45	49
800	60	65	61	62	63	62	64	62	63	63	64	68	71	68	65	64	58	43	47
1000	62	61	61	61	61	61	60	59	56	60	63	65	68	66	61	61	55	41	44
1250	63	62	61	64	63	63	60	58	57	57	60	63	66	64	61	63	55	43	47
1600	71	68	70	68	69	68	67	63	61	60	61	64	67	69	67	70	63	52	55
2000	69	67	70	70	71	68	67	61	58	57	58	63	65	67	66	69	62	52	53
2500	65	65	68	65	67	63	58	57	55	54	56	61	65	69	68	70	63	53	54
3150	65	66	67	63	64	63	60	58	54	53	53	59	63	67	65	67	60	49	49
4000	83	83	81	79	78	69	75	73	68	64	63	70	65	71	72	79	72	62	59
5000	69	70	70	71	70	65	68	66	60	57	56	61	63	67	66	67	62	52	51
6300	68	70	71	71	70	67	65	63	57	57	55	61	61	66	64	64	60	50	50
8000	79	80	81	81	81	75	75	74	67	66	65	69	63	73	68	71	66	56	56
10000	67	66	70	70	70	63	65	63	57	55	54	57	58	60	59	60	55	45	47
OVERALL	86	86	85	86	86	83	84	84	83	84	85	85	85	86	86	85	79	73	75

TABLE: NORMALIZED SOUND PRESSURE LEVEL (DB)
1/3 OCTAVE BAND
DISTANCE = 250 FEET

IDENTIFICATION:
OMEGA 11.1
TEST 74-004-029
RUN
AIRCRAFT CODE 033
OPERATION CODE 21
PROFILE VERSION W
15 MAR 82
PAGE C4

NOISE SOURCE/SUBJECT:
T-38A AIRCRAFT
ENG. J85-GE-5A

OPERATION:
70 % RPM ENG RUNUP
70 % RPM

METEOROLOGY:
TEMP = 59 F
BAR PRESS =29.92 IN HG
REL HUMID = 70 %
DELTA N = 2.0 DB

BAND CENTER FREQ (HZ)	ANGLE (DEGREES) 0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
50	69	67	66	70	71	69	70	71	72	72	72	73	75	75	74	74	70	67	69
63	68	66	67	66	71	66	69	70	71	70	70	71	74	75	74	73	68	66	67
80	66	64	66	67	67	65	68	69	67	67	68	71	73	73	71	70	66	64	61
100	66	65	66	66	67	66	69	69	69	69	68	72	73	76	75	73	70	62	62
125	70	69	71	71	71	70	72	74	73	73	74	78	77	80	79	77	72	60	64
160	77	76	79	78	80	77	82	82	82	81	81	83	83	83	83	82	77	59	65
200	74	73	77	76	77	76	80	80	79	77	79	80	82	79	79	79	72	57	61
250	68	66	67	68	70	70	71	71	71	68	71	75	76	74	70	73	68	55	58
315	63	64	67	66	69	66	68	69	69	68	70	73	74	77	72	72	69	53	54
400	68	72	70	72	71	67	72	70	72	69	72	77	78	78	75	72	71	51	51
500	66	66	71	70	70	67	71	69	71	68	71	77	73	77	75	71	72	50	51
630	63	62	66	64	65	62	64	63	63	61	63	71	76	71	66	63	65	47	47
800	63	65	64	64	64	62	65	63	62	61	64	71	74	75	69	66	66	45	43
1000	62	62	62	63	64	63	64	62	61	60	63	70	73	70	65	62	64	44	41
1250	62	63	62	64	64	65	63	62	59	58	62	67	71	68	64	63	66	45	43
1600	66	65	69	65	66	66	65	62	56	56	59	62	67	71	69	71	73	54	51
2000	71	69	58	68	72	70	68	65	57	58	58	61	66	70	67	72	73	55	50
2500	69	69	71	67	70	67	68	62	57	57	57	59	64	68	69	75	75	57	[illegible]
3150	68	67	69	65	68	68	66	61	57	55	54	58	62	67	71	70	72	52	48
4000	74	75	76	73	72	70	70	64	61	60	58	61	63	69	72	74	78	58	53
5000	85	83	85	83	81	77	79	75	73	70	69	68	65	72	72	72	76	58	54
6300	70	69	71	70	69	67	69	65	63	59	59	59	63	66	66	67	70	52	49
8000	74	74	75	73	72	68	68	62	59	57	60	63	68	66	65	68	69	52	50
10000	76	76	78	75	75	73	73	68	64	60	60	62	65	69	68	73	70	55	55
OVERALL	86	86	85	87	87	84	87	86	86	84	85	88	83	89	88	88	86	73	74

TABLE: PERCEIVED NOISE LEVEL (PNDB)

AS A FUNCTION OF ANGLE AND DISTANCE FROM SOURCE

IDENTIFICATION:
OMEGA 11.1
TEST 74-004-029
RUN 01
AIRCRAFT CODE 033
OPERATION CODE 95
PROFILE VERSION W
15 MAR 82
PAGE 01

NOISE SOURCE/SUBJECT:
T-38A AIRCRAFT
ENG. J85-GE-5A

OPERATION:
MAX PWR A/B
100 % RPM

METEOROLOGY:
TEMP = 70 F
BAR PRESS =29.50 IN HG
REL HUMID = 60 %

DISTANCE (FEET)	ANGLE (DEGREES) 0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
200	111.4	113.6	113.5	114.2	116.6	117.5	117.8	121.4	120.3	124.4	126.2	131.0	136.7	138.5	135.7	130.0	101.1	97.9	95.3
250	109.1	111.3	111.2	112.0	114.4	115.3	115.6	119.2	118.1	122.3	124.0	128.8	134.6	136.3	133.6	127.9	98.9	95.7	93.1
315	106.8	108.9	108.8	109.7	112.2	113.0	113.4	117.0	115.9	120.0	121.8	126.6	132.4	134.2	131.5	125.8	96.8	93.5	90.8
400	104.3	106.5	106.4	107.4	109.9	110.7	111.2	114.7	113.7	117.7	119.6	124.3	130.2	132.0	129.3	123.6	94.5	91.2	88.4
500	101.8	103.9	103.9	105.0	107.6	108.4	108.9	112.2	111.3	115.4	117.3	122.0	128.0	129.7	127.0	121.4	92.1	88.9	86.0
630	99.1	101.2	101.3	102.6	105.2	105.3	106.5	109.7	108.9	112.3	114.9	119.6	125.6	127.3	124.7	119.1	89.7	86.4	83.4
800	96.4	98.3	98.7	100.1	102.7	103.4	104.0	107.2	106.5	110.3	112.4	117.1	123.2	124.3	122.3	116.7	87.1	83.3	80.8
1000	93.7	95.2	96.0	97.4	100.1	100.8	101.4	104.6	103.9	107.5	109.8	114.5	120.7	122.3	119.8	114.2	84.4	81.2	78.1
1250	90.8	92.4	93.2	94.5	97.3	98.0	98.7	101.6	101.1	104.8	107.1	111.8	113.1	119.7	117.2	111.6	81.6	78.4	75.3
1500	87.6	89.3	90.2	91.5	94.3	95.0	95.8	98.9	98.2	101.9	104.2	108.9	115.3	116.3	114.4	108.8	78.6	75.3	72.2
2080	84.6	86.1	87.0	88.4	91.2	91.8	92.7	95.7	95.0	98.8	101.2	105.8	112.4	113.3	111.5	105.8	75.4	72.1	69.0
2500	81.1	82.5	83.5	84.9	87.8	88.4	89.3	92.3	91.6	95.4	97.9	102.5	109.1	110.5	108.2	102.5	71.8	68.6	65.4
3150	76.9	78.4	79.4	80.8	83.8	84.3	85.3	88.3	87.6	91.4	93.9	98.5	105.3	106.7	104.4	98.6	67.6	64.3	61.1
4000	72.3	73.8	74.8	76.3	79.4	79.9	80.9	83.9	83.2	87.0	89.6	94.2	101.0	102.4	100.0	94.2	62.8	59.5	56.2
5000	67.4	68.9	69.9	71.4	74.5	75.0	76.1	79.0	78.4	82.1	84.8	89.4	96.3	97.7	95.3	89.5	57.6	54.1	50.8
6300	62.2	63.6	64.7	66.2	53.4	69.8	71.1	74.0	73.3	77.0	79.8	84.4	91.4	92.7	90.4	84.6	51.9	48.5	44.8
8000	57.8	59.4	60.5	62.0	55.2	65.7	67.0	69.8	69.1	72.9	75.8	80.3	87.5	88.5	86.6	80.8	47.4	43.5	39.3
10000	53.3	54.8	56.0	57.5	60.7	61.1	62.6	65.3	64.7	68.4	71.5	75.9	83.3	84.5	82.5	76.7	42.3	37.8	33.4
12500	48.2	49.6	50.9	52.5	55.8	56.2	57.7	60.4	59.8	63.5	66.7	71.1	75.8	80.0	78.1	72.2	36.5	31.6	26.6
16000	42.2	43.8	45.3	46.9	50.4	50.8	52.5	55.0	54.4	58.1	61.4	65.8	73.8	75.0	73.1	67.3	29.2	23.5	18.0
20000	35.0	37.0	38.3	39.9	44.0	44.3	46.2	48.9	48.4	52.1	55.5	60.0	68.2	63.4	67.6	61.7	19.4	11.6	9.4
25000	25.4	27.7	29.2	31.3	36.1	36.4	38.4	41.6	40.8	45.0	46.8	53.3	61.8	63.1	61.4	55.4	9.7		.8

TABLE: TONE-CORRECTED, PERCEIVED NOISE LEVEL (PNDB)

AS A FUNCTION OF ANGLE AND DISTANCE FROM SOURCE

IDENTIFICATION:
OMEGA 11.1
TEST 74-004-029
RUN 01
AIRCRAFT CODE 033
OPERATION CODE 95
PROFILE VERSION W
15 MAR 82
PAGE E1

NOISE SOURCE/SUBJECT:
T-38A AIRCRAFT
ENG. J85-GE-5A

OPERATION:
MAX PWR A/B
100 % RPM

METEOROLOGY:
TEMP = 70 F
BAR PRESS =29.50 IN HG
REL HUMID = 60 %

DISTANCE (FEET)	ANGLE (DEGREES) 0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
200	114.0	116.0	115.5	115.5	117.3	118.6	118.5	121.4	121.5	125.6	126.2	131.0	137.9	138.5	137.1	130.0	101.1	97.9	95.3
250	111.7	113.7	113.2	113.3	115.2	116.4	116.3	119.2	119.3	123.4	124.0	128.8	135.8	136.3	135.0	127.9	98.9	95.7	93.1
315	109.3	111.3	110.9	111.0	113.0	114.1	114.2	117.0	117.0	121.2	121.8	126.6	133.6	134.2	132.9	125.8	96.8	93.5	90.8
400	106.9	108.8	108.5	108.7	110.7	111.8	111.9	114.7	114.8	118.9	119.6	124.3	131.4	132.0	130.7	123.6	94.5	91.2	88.4
500	104.4	106.3	105.9	106.3	108.4	109.5	109.6	112.2	112.5	116.5	117.3	122.0	129.2	129.7	128.4	121.4	92.1	88.9	86.0
630	101.7	103.6	103.3	103.9	106.0	107.0	107.2	109.7	110.1	114.0	114.9	119.6	126.8	127.3	126.1	119.1	89.7	86.4	83.4
800	99.0	100.7	100.5	101.4	103.5	104.5	104.8	107.2	107.6	111.4	112.4	117.1	124.4	124.9	123.7	116.7	87.1	83.9	80.8
1000	96.3	97.6	96.1	98.7	100.8	101.9	102.2	104.6	105.0	108.7	109.8	114.5	121.9	122.3	121.2	114.2	84.4	81.2	78.1
1250	93.4	94.7	95.2	95.8	98.0	99.1	99.4	101.8	102.2	106.0	107.1	111.8	119.3	119.7	118.6	111.6	81.6	78.4	75.3
1600	90.4	91.7	92.2	92.8	95.1	96.1	96.5	98.9	99.3	103.0	104.2	108.9	116.5	116.9	115.8	108.8	78.6	75.3	72.2
2000	87.1	88.5	89.0	89.6	92.0	92.9	93.4	95.7	96.2	99.9	101.2	105.8	113.6	113.9	112.9	105.8	75.4	72.1	69.0
2500	83.6	64.9	85.5	86.2	88.6	89.5	90.0	92.3	92.8	96.5	97.9	102.5	110.3	110.6	109.6	102.5	71.8	68.6	65.4
3150	79.5	60.8	81.4	62.1	84.6	85.4	86.1	68.3	88.8	92.6	93.9	98.5	106.5	106.7	105.8	98.6	67.6	64.3	61.1
4000	74.4	75.7	76.5	77.3	80.0	80.7	81.5	63.9	84.1	87.9	89.6	94.2	102.0	102.4	101.2	94.2	62.8	59.5	56.2
5000	68.9	70.3	71.1	72.2	75.0	75.6	76.6	79.0	79.0	82.8	84.8	89.4	97.0	97.7	96.2	89.5	57.6	54.1	50.8
6300	63.2	64.6	65.5	66.7	69.7	70.3	71.4	74.0	73.7	77.5	79.8	84.4	91.9	92.7	91.0	84.6	51.9	48.5	44.8
8000	56.3	59.8	60.9	62.3	55.4	65.9	67.1	69.8	69.3	73.1	75.8	80.3	87.8	88.9	86.9	80.8	47.4	43.5	39.3
10000	53.3	54.8	56.0	57.5	60.7	61.1	62.6	65.3	64.7	68.4	71.5	75.9	83.3	84.5	82.5	76.7	42.3	37.8	33.4
12500	48.2	49.6	50.9	52.5	55.8	56.2	57.7	60.4	59.8	63.5	66.7	71.1	78.8	80.0	78.1	72.2	36.5	31.6	26.6
16000	42.2	43.8	45.3	46.9	50.4	50.8	52.5	55.0	54.4	58.1	61.4	65.8	73.8	75.0	73.1	67.3	29.2	23.5	18.0
20000	35.6	37.0	38.3	39.9	44.0	44.3	46.2	48.9	48.4	52.1	55.5	60.0	68.2	69.4	67.6	61.7	19.4	11.6	9.4
25000	25.4	27.7	29.2	31.3	36.1	36.4	38.4	41.6	40.8	45.0	48.8	53.3	61.8	63.1	61.4	55.4	9.7		.8

TABLE: A-WEIGHTED OVERALL SOUND LEVEL (DBA)

AS A FUNCTION OF ANGLE AND DISTANCE FROM SOURCE

IDENTIFICATION:
OMEGA 11.1
TEST 74-004-029
RUN 01
AIRCRAFT CODE 033
OPERATION CODE 95
PROFILE VERSION W
15 MAR 82
PAGE F1

NOISE SOURCE/SUBJECT:
T-38A AIRCRAFT
ENG. J85-GE-5A

OPERATION:
MAX PWR A/B
100 % RPM

METEOROLOGY:
TEMP = 70 F
BAR PRESS =29.50 IN HG
REL HUMID = 60 %

DISTANCE (FEET)	ANGLE (DEGREES) 0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
200	97.3	99.0	99.7	101.3	104.1	104.8	105.3	109.0	108.0	112.2	114.6	119.5	125.0	126.9	123.6	118.1	87.8	84.7	81.9
250	95.1	96.9	97.5	99.1	102.0	102.6	103.2	106.8	105.3	110.0	112.5	117.4	122.9	124.8	121.5	116.1	85.7	82.7	79.8
315	92.9	94.6	95.4	97.0	99.8	100.5	101.1	104.7	103.8	107.9	110.3	115.3	120.8	122.7	119.5	114.0	83.6	80.6	77.7
400	90.7	92.4	93.1	94.8	97.6	98.3	99.0	102.5	101.6	105.7	108.2	113.1	118.7	120.5	117.4	111.9	81.5	78.4	75.6
500	88.4	90.1	90.9	92.5	95.4	96.1	96.8	100.3	99.4	103.5	106.0	110.9	116.5	118.4	115.2	109.7	79.3	76.2	73.3
630	86.1	87.7	88.6	90.2	93.2	93.8	94.6	98.0	97.1	101.2	103.7	108.6	114.3	116.2	113.0	107.5	77.1	74.0	71.0
800	83.7	85.3	86.2	87.9	90.9	91.4	92.3	95.7	94.8	98.8	101.5	106.3	112.1	114.8	110.8	105.3	74.8	71.6	68.7
1000	81.3	82.8	83.8	85.5	88.5	89.0	89.9	93.3	92.4	96.4	99.1	104.0	103.8	111.7	108.6	103.0	72.4	69.2	66.3
1250	78.8	80.3	81.3	83.0	86.0	86.5	87.5	90.8	89.9	93.9	96.7	101.5	107.4	109.3	106.2	100.5	69.9	66.7	63.7
1600	76.2	77.6	78.7	80.5	83.5	83.9	85.0	88.2	87.4	91.3	94.2	98.9	105.0	106.9	103.8	98.1	67.2	64.1	61.1
2000	73.5	74.9	76.0	77.8	80.8	81.2	82.4	85.5	84.7	88.6	91.6	96.3	102.5	104.3	101.3	95.5	64.5	61.4	58.3
2500	70.5	71.9	73.0	74.8	77.9	78.2	79.5	82.6	81.7	85.6	88.8	93.3	99.7	101.4	98.5	92.6	61.4	58.3	55.3
3150	67.1	68.5	69.6	71.4	74.6	74.9	76.2	79.3	78.3	82.2	85.6	90.0	96.4	98.2	95.1	89.2	58.0	54.9	51.8
4000	63.3	64.7	65.8	67.6	70.8	71.1	72.5	75.6	74.6	78.5	81.9	86.4	92.7	94.5	91.4	85.5	54.1	51.0	48.0
5000	59.0	60.4	61.5	63.4	66.6	66.9	68.3	71.4	70.3	74.3	77.8	82.2	88.5	90.4	87.1	81.2	49.8	46.7	43.7
6300	54.5	55.9	56.9	58.8	62.1	62.3	63.7	67.0	65.8	69.7	73.3	77.7	84.0	85.3	82.6	76.7	45.2	42.1	39.1
8000	50.6	51.9	53.0	54.9	58.1	58.3	59.9	62.9	61.8	65.6	69.3	73.6	80.2	82.3	78.9	72.9	41.4	38.3	35.2
10000	46.4	47.7	48.9	50.7	53.9	53.9	55.6	58.5	57.4	61.1	64.9	69.1	76.1	77.7	74.8	68.8	37.3	34.1	31.0
12500	41.8	43.1	44.4	46.0	49.2	49.2	51.0	53.7	52.7	56.3	60.1	64.2	71.6	73.0	70.3	64.2	32.9	29.6	26.4
16000	36.8	38.1	39.4	40.9	44.1	44.1	45.9	48.5	47.5	51.1	54.8	58.8	65.5	67.3	65.4	59.2	28.0	24.7	21.4
20000	31.3	32.6	33.9	35.3	38.4	38.4	40.2	42.6	41.0	45.3	49.0	52.9	60.9	61.9	59.8	53.7	22.8	19.4	16.0
25000	25.3	26.4	27.8	29.1	32.1	32.1	33.9	36.2	35.5	38.9	42.4	46.4	54.5	55.5	53.5	47.5	17.2	13.7	10.2

TABLE: TUNE-CORRECTED, A-WEIGHTED OVERALL SOUND LEVEL (DBA)

AS A FUNCTION OF ANGLE AND DISTANCE FROM SOURCE

NOISE SOURCE/SUBJECT:	OPERATION:	METEOROLOGY:	IDENTIFICATION:
T-38A AIRCRAFT	MAX PWR A/B	TEMP = 70 F	OMEGA 11.1
ENG. J85-GE-5A	100 % RPM	BAR PRESS =29.50 IN HG	TEST 74-004-029
		REL HUMID = 60 %	RUN 01
			AIRCRAFT CODE 033
			OPERATION CODE 95
			PROFILE VERSION W
			15 MAR 82
			PAGE G1

DISTANCE (FEET)	ANGLE (DEGREES) 0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
200	99.8	101.4	101.7	102.5	104.8	105.9	106.1	109.0	109.2	113.3	114.6	119.5	126.2	126.3	125.0	118.1	87.8	84.7	81.9
250	97.7	99.2	99.6	100.4	102.7	103.7	104.0	106.8	107.1	111.2	112.5	117.4	124.1	124.3	123.0	116.1	85.7	82.7	79.8
315	95.5	97.0	97.4	98.2	100.6	101.6	101.8	104.7	104.9	109.1	110.3	115.3	122.0	122.7	120.9	114.0	83.6	80.6	77.7
400	93.3	94.8	95.2	96.0	98.4	99.4	99.7	102.5	102.7	106.9	108.2	113.1	113.9	120.5	118.8	111.9	81.5	78.4	75.6
500	91.0	92.4	92.9	93.8	96.2	97.2	97.5	100.3	100.5	104.7	106.0	110.9	117.7	118.4	116.6	109.7	79.3	76.2	73.3
630	88.7	90.1	90.6	91.5	93.9	94.9	95.3	98.0	98.3	102.4	103.7	108.6	115.5	116.2	114.4	107.5	77.1	74.0	71.0
800	86.3	87.7	88.3	89.2	91.6	92.5	93.0	95.7	95.9	100.0	101.5	106.3	113.3	114.0	112.2	105.3	74.8	71.6	68.7
1000	83.9	85.2	85.8	86.6	89.3	90.1	90.7	93.3	93.5	97.6	99.1	104.0	111.0	111.7	110.0	103.0	72.4	69.2	66.3
1250	81.4	82.6	83.3	84.3	86.8	87.6	88.2	90.8	91.1	95.1	96.7	101.5	108.6	109.3	107.6	100.5	69.9	66.7	63.7
1600	78.6	80.0	80.7	81.7	84.2	85.0	85.7	88.2	88.5	92.5	94.2	98.9	106.2	106.3	105.2	98.1	67.2	64.1	61.1
2000	76.1	77.3	78.1	79.1	81.6	82.3	83.1	85.5	85.8	89.8	91.6	96.3	103.7	104.3	102.7	95.5	64.5	61.4	58.3
2500	73.1	74.3	75.1	76.1	78.7	79.3	80.2	82.6	82.8	86.8	88.8	93.3	100.9	101.4	99.9	92.6	61.4	58.3	55.3
3150	69.7	70.9	71.7	72.7	75.3	76.0	76.9	79.3	79.5	83.4	85.6	90.0	97.6	98.2	96.5	89.2	58.0	54.9	51.8
4000	65.4	66.6	67.4	68.7	71.5	72.0	73.1	75.6	75.5	79.4	81.9	86.4	93.7	94.5	92.5	85.5	54.1	51.0	48.0
5000	60.6	61.8	62.7	64.1	67.1	67.5	68.7	71.4	71.0	75.0	77.8	82.2	83.2	90.4	88.0	81.2	49.8	46.7	43.7
6300	55.5	56.8	57.7	59.3	52.4	62.7	64.0	67.0	66.3	70.2	73.3	77.7	84.5	85.3	83.2	76.7	45.2	42.1	39.1
8000	51.1	52.4	53.4	55.2	58.3	58.5	60.0	62.9	62.0	65.8	69.3	73.6	80.5	82.0	79.2	72.9	41.4	38.3	35.2
10000	46.4	47.7	48.9	50.7	53.9	53.9	55.6	58.5	57.4	61.1	64.9	69.1	75.1	77.7	74.8	68.8	37.3	34.1	31.0
12500	41.8	43.1	44.4	46.0	43.2	49.2	51.0	53.7	52.7	56.3	60.1	64.2	71.6	73.0	70.3	64.2	32.9	29.6	26.4
16000	36.8	36.1	39.4	40.9	44.1	44.1	45.9	48.5	47.5	51.1	54.8	58.8	65.5	67.8	65.4	59.2	28.0	24.7	21.4
20000	31.3	32.6	33.9	35.3	36.4	38.4	40.2	42.6	41.6	45.3	49.0	52.9	60.9	61.9	59.8	53.7	22.8	19.4	16.0
25000	25.3	26.4	27.8	29.1	32.1	32.1	33.9	36.2	35.5	36.9	42.4	46.4	54.5	55.5	53.5	47.5	17.2	13.7	10.2

TABLE: NOISE LEVEL AS A FUNCTION OF ANGLE AROUND SOURCE

DISTANCE = 250 FEET

NOISE SOURCE/SUBJECT:	OPERATION:	METEOROLOGY:	IDENTIFICATION:
T-38A AIRCRAFT	MAX PWR A/B	TEMP = 70 F	OMEGA 11.1
ENG. J85-GE-5A	100 % RPM	BAR PRESS =29.50 IN HG	TEST 74-004-029
		REL HUMID = 60 %	RUN 01
			AIRCRAFT CODE 033
			OPERATION CODE 95
			PROFILE VERSION W
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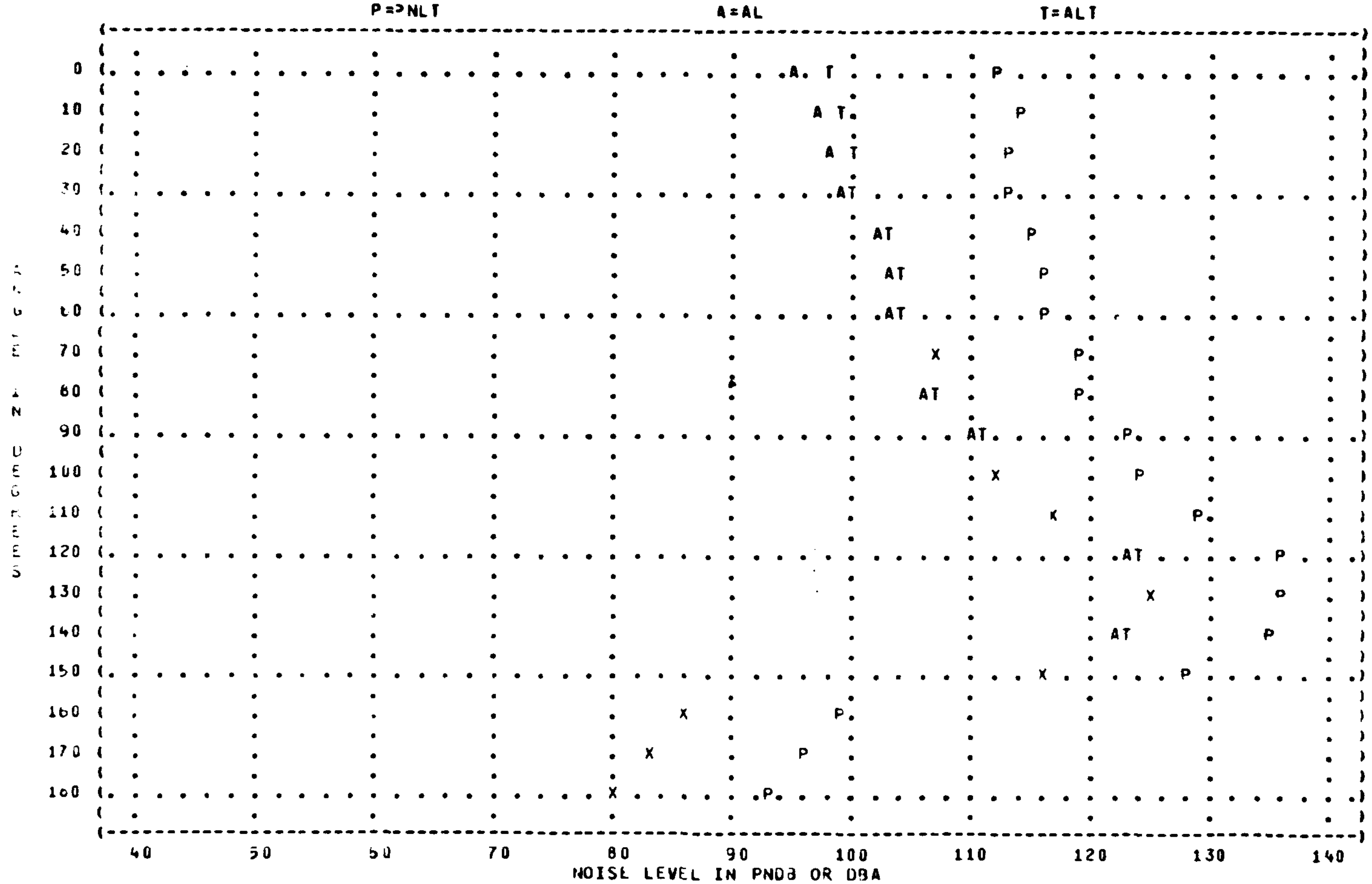
			PAGE J1

P=PNLT A=AL T=ALT



PROFILE DATA WRITTEN ON FILE 'TAPE2' AS FOLLOWS:
PNLT: DATA FOR ANGLES: 0 60 60 90 100 120 140 150 160 180
AL: DATA FOR ANGLES: 0 60 70 80 100 120 130 150 160 180
ALT: DATA FOR ANGLES: 0 60 60 90 100 120 140 150 160 180

TABLE: PERCEIVED NOISE LEVEL (PNDB)

AS A FUNCTION OF ANGLE AND DISTANCE FROM SOURCE

IDENTIFICATION:
OMEGA 11.1
TEST 74-004-029
RUN 02
AIRCRAFT CODE 033
OPERATION CODE 96
PROFILE VERSION W
15 MAR 82
PAGE D2

NOISE SOURCE/SUBJECT:
T-38A AIRCRAFT
ENG. J85-GE-5A

OPERATION:
50 % RPM

METEOROLOGY:
TEMP = 70 F
BAR PRESS =29.50 IN HG
REL HUMID = 60 %

DISTANCE (FEET)	ANGLE (DEGREES) 0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
200	103.1	103.3	103.0	101.9	101.4	96.8	98.5	97.0	93.6	92.4	92.5	96.0	95.5	98.3	97.9	101.2	94.8	84.6	83.4
250	100.7	100.9	100.5	99.5	99.0	94.3	96.1	94.6	91.2	90.1	90.2	93.7	93.2	95.3	95.5	96.8	92.4	82.2	81.0
315	98.3	98.4	98.1	97.0	96.5	91.6	93.6	92.2	88.8	87.7	87.9	91.3	90.8	93.5	93.1	96.4	90.0	79.7	76.5
400	95.6	95.2	95.5	94.4	93.9	88.8	91.1	88.6	86.3	85.2	85.5	88.6	88.4	91.0	90.6	93.8	87.4	77.1	76.0
500	92.9	93.0	92.8	91.6	91.2	86.0	88.3	86.9	83.6	82.6	83.0	86.2	85.8	88.2	87.9	91.2	84.7	74.3	73.3
630	89.9	90.1	89.8	88.7	88.2	83.1	85.4	84.0	80.7	80.0	80.5	83.4	83.1	85.5	85.1	88.7	81.8	71.4	70.3
800	86.7	86.9	86.5	85.5	85.1	80.0	82.3	80.9	77.7	77.4	77.9	80.4	80.5	82.5	82.1	85.3	78.7	68.2	67.2
1000	83.3	83.5	83.2	82.0	81.7	76.7	78.9	77.5	74.4	74.6	75.1	77.3	77.7	79.4	78.5	82.0	75.3	64.6	63.7
1250	79.5	79.7	79.4	78.3	77.9	73.2	75.2	73.8	70.8	71.6	72.1	74.2	74.8	76.1	75.3	78.3	71.6	60.8	59.9
1600	75.2	75.5	75.2	74.1	73.8	69.5	71.1	69.7	67.5	66.4	69.1	71.1	71.7	72.5	71.4	74.3	67.5	56.4	55.6
2000	70.5	70.6	70.5	69.4	69.2	65.6	66.6	65.2	64.1	65.1	65.8	67.3	68.5	69.1	67.8	69.9	63.0	51.3	50.7
2500	65.1	65.4	65.2	64.1	64.1	61.2	61.3	60.2	59.6	60.8	61.6	63.8	64.8	64.3	63.6	64.8	57.6	44.9	45.0
3150	59.0	59.3	59.1	58.1	58.8	56.2	56.0	55.2	54.7	55.9	57.0	59.3	60.5	60.2	58.7	59.0	51.8	36.2	37.9
4000	52.5	52.5	52.9	52.4	53.4	50.8	50.3	49.4	49.1	50.7	52.1	54.3	55.6	55.3	53.4	53.7	45.4	27.0	29.7
5000	45.9	44.7	46.1	45.4	46.6	44.1	43.6	42.6	42.3	44.7	46.5	48.9	50.2	49.5	47.4	47.2	38.4	13.0	17.9
6300	37.3	37.4	38.4	37.8	38.6	35.7	35.7	35.0	34.9	38.1	40.1	42.5	44.0	43.1	40.5	39.0	29.0		6.1
8000	28.3	30.6	31.4	31.2	32.5	27.6	29.8	28.1	28.9	32.6	34.3	37.3	38.6	37.5	34.4	31.5	19.9		
10000	17.2	22.0	22.5	22.0	24.3	15.9	20.8	20.3	22.2	27.2	29.0	31.8	33.0	31.2	27.4	21.2	10.6		
12500	7.3	12.8	12.9	13.7	14.9	4.2	10.1	12.1	13.4	18.7	21.6	25.5	25.5	24.0	19.4	12.3	1.1		
16000		3.5	3.3	5.3	5.4			3.8	4.5	10.5	12.4	15.9	17.6	13.3	9.7	3.3			
20000										2.3	3.2	6.2	8.1	3.5					
25000																			

TABLE: TONE-CORRECTED, PERCEIVED NOISE LEVEL (PNDB)

AS A FUNCTION OF ANGLE AND DISTANCE FROM SOURCE

NOISE SOURCE/SUBJECT:	OPERATION:	METEOROLOGY:	IDENTIFICATION:
T-38A AIRCRAFT ENG. J85-GE-5A	50 % RPM	TEMP = 70 F BAR PRESS =29.50 IN HG REL HUMID = 60 %	OMEGA 11.1 TEST 74-004-029 RUN 02 AIRCRAFT CODE 033 OPERATION CODE 96 PROFILE VERSION W 15 MAR 82 PAGE E2

DISTANCE (FEET)	ANGLE (DEGREES) 0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
200	108.3	103.2	107.2	105.9	105.0	98.4	101.3	100.6	97.3	95.6	95.3	99.1	96.4	99.8	99.9	105.0	98.2	88.3	86.1
250	105.9	105.8	104.8	103.5	102.6	95.9	99.0	98.3	95.0	93.3	93.0	96.8	94.1	97.5	97.6	102.7	95.9	85.9	83.7
315	103.4	103.3	102.3	101.0	100.2	93.2	96.5	95.8	92.5	90.9	90.6	94.4	91.8	95.1	95.2	100.2	93.4	83.4	81.2
400	100.6	100.7	99.7	98.4	97.6	90.4	93.9	93.2	90.0	88.4	88.3	91.9	89.3	92.5	92.7	97.7	90.9	80.8	78.6
500	98.0	98.0	96.9	95.6	94.8	87.6	91.2	90.5	87.3	85.8	85.9	89.3	86.7	89.9	90.0	95.0	88.1	78.0	75.9
630	95.1	95.0	94.0	92.7	91.9	84.7	88.3	87.6	84.5	83.2	83.4	86.5	84.0	87.1	87.2	92.2	85.3	75.1	73.0
800	91.9	91.9	90.8	89.5	88.7	81.6	85.2	84.5	81.5	80.5	80.7	83.5	81.4	84.1	84.2	89.1	82.2	71.9	69.8
1000	86.4	88.4	87.4	86.0	85.3	78.3	81.8	81.1	78.2	77.7	77.9	80.4	78.7	81.0	80.9	85.6	78.8	68.3	66.4
1250	84.6	84.6	83.6	82.2	81.6	74.8	78.1	77.4	74.6	74.7	75.0	77.3	75.7	77.5	77.4	82.2	75.1	64.5	62.6
1600	80.4	80.4	79.4	78.1	77.4	71.2	74.0	73.3	71.2	71.6	72.0	74.2	72.7	74.1	73.5	78.2	71.0	60.1	58.3
2000	75.7	75.7	74.7	73.4	72.9	67.2	69.5	68.8	67.8	68.2	68.7	71.0	69.4	70.7	69.9	73.8	66.4	55.0	53.3
2500	70.3	70.4	69.4	68.1	67.7	62.8	64.2	63.9	63.4	63.9	64.5	66.9	65.7	66.5	65.6	68.7	61.0	48.6	47.7
3150	64.1	64.2	63.3	62.1	62.5	57.8	58.8	58.8	58.4	59.1	59.9	62.4	61.4	61.3	60.7	62.8	55.2	39.9	40.6
4000	56.6	56.4	56.2	55.6	56.3	52.1	52.6	52.3	52.1	53.2	54.4	56.8	56.3	56.5	55.1	56.7	48.2	29.9	31.8
5000	49.0	47.6	48.5	47.7	48.7	45.0	45.3	44.8	44.5	46.6	48.2	50.8	50.8	50.5	48.7	49.5	40.5	15.2	19.5
6300	39.4	39.4	40.1	39.4	40.0	36.4	36.9	36.4	36.4	39.4	41.2	43.8	44.4	43.7	41.3	40.6	30.3	.6	7.1
8000	29.3	31.6	32.3	32.0	33.2	27.9	30.3	28.8	29.7	33.2	34.9	37.9	38.8	37.3	34.8	32.2	20.6		
10000	17.2	22.0	22.5	22.0	24.3	15.9	20.8	20.3	22.2	27.2	29.0	31.8	33.0	31.2	27.4	21.2	10.6		
12500	7.3	12.6	12.9	13.7	14.9	4.2	10.1	12.1	13.4	18.7	21.6	25.5	26.5	24.0	19.4	12.3	1.1		
16000		3.5	3.3	5.3	5.4			3.8	4.5	10.5	12.4	15.9	17.6	13.9	9.7	3.3			
20000										2.3	3.2	6.2	8.1	3.5					
25000																			

TABLE: A-WEIGHTED OVERALL SOUND LEVEL (DBA)

AS A FUNCTION OF ANGLE AND DISTANCE FROM SOURCE

IDENTIFICATION:
OMEGA 11.1
TEST 74-004-029
RUN 02
AIRCRAFT CODE 033
OPERATION CODE 96
PROFILE VERSION W
15 MAR 82
PAGE F2

NOISE SOURCE/SUBJECT:
T-38A AIRCRAFT
ENG. J85-GE-5A

OPERATION:
50 % RPM

METEOROLOGY:
TEMP = 70 F
BAR PRESS =29.50 IN HG
REL HUMID = 60 %

DISTANCE (FEET)	ANGLE (DEGREES) 0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
200	83.1	88.1	87.9	87.3	56.0	81.9	83.0	81.3	77.3	78.2	78.8	81.1	81.9	83.2	81.8	85.0	78.9	68.3	67.2
250	85.7	65.7	85.4	84.7	84.1	79.4	80.5	78.9	75.7	76.0	76.6	78.9	73.8	80.3	79.6	82.7	76.5	65.9	64.9
315	63.1	63.1	82.6	82.0	81.4	76.9	77.9	76.4	73.4	73.8	74.5	76.7	77.6	78.5	77.2	80.2	74.1	63.4	62.5
400	80.4	80.4	80.0	79.2	78.7	74.7	75.3	73.7	71.0	71.6	72.3	74.4	75.4	76.2	74.9	77.7	71.5	60.8	60.0
500	77.5	77.5	77.1	76.2	75.6	71.5	72.5	71.0	68.6	69.3	70.1	72.1	73.2	73.3	72.4	75.1	68.9	58.2	57.4
630	74.5	74.5	74.1	73.1	72.7	68.6	69.6	68.1	66.1	66.9	67.7	69.7	70.9	71.3	69.8	72.4	66.1	55.3	54.8
800	71.3	71.2	70.8	69.8	69.6	65.8	66.6	65.2	63.5	64.5	65.4	67.3	68.5	68.7	67.2	69.5	63.2	52.4	52.0
1000	67.8	67.8	67.4	66.4	56.3	62.8	63.5	62.2	60.9	62.1	63.0	64.8	66.1	66.1	64.5	66.4	60.1	49.2	49.1
1250	64.1	64.1	63.8	62.9	52.9	59.7	60.3	53.1	58.1	59.5	60.4	62.2	63.6	63.4	61.6	63.2	56.9	45.8	46.0
1600	60.2	60.2	60.0	59.2	59.5	56.6	57.0	55.9	55.3	56.8	57.6	59.6	61.0	60.5	58.7	59.7	53.6	42.3	42.8
2000	56.0	56.2	56.1	55.5	56.0	53.4	53.6	52.7	52.4	54.0	55.1	56.9	58.3	57.7	55.7	56.2	50.1	38.5	39.5
2500	51.7	51.9	52.1	51.6	52.2	49.8	50.0	49.1	49.0	50.8	52.0	53.8	55.3	54.5	52.2	52.3	46.3	34.4	35.8
3150	47.2	47.4	47.8	47.4	48.1	45.9	46.0	45.1	45.2	47.0	48.4	50.3	51.9	50.3	48.4	48.1	42.2	30.1	31.8
4000	42.6	42.9	43.3	43.1	43.7	41.7	41.8	40.9	41.0	42.9	44.4	46.3	48.1	47.0	44.2	43.7	37.8	25.5	27.4
5000	37.7	38.1	38.6	38.3	39.0	37.1	37.3	36.3	36.4	38.4	39.9	41.9	43.9	42.5	39.6	38.9	33.0	20.5	22.7
6300	32.6	33.2	33.6	33.4	33.9	32.1	32.4	31.5	31.7	33.7	35.3	37.3	39.3	37.3	34.8	33.8	27.9	15.3	17.6
8000	27.8	28.3	29.2	29.0	29.6	27.5	28.2	27.7	28.0	30.1	31.7	33.6	35.4	33.3	30.9	29.3	23.4	10.8	13.2
10000	22.8	24.5	24.7	24.6	25.2	22.8	23.9	23.7	24.1	26.3	27.7	29.6	31.1	29.7	26.9	24.7	18.9	6.4	8.9
12500	17.8	19.8	20.0	20.0	20.6	18.0	19.4	19.4	19.9	22.1	23.4	25.2	26.5	25.2	22.5	20.0	14.2	2.2	4.6
16000	12.6	14.8	15.1	15.1	15.9	13.1	14.7	14.9	15.4	17.6	18.7	20.3	21.4	20.2	17.9	15.2	9.3		.3
20000	7.2	9.5	9.9	9.9	10.8	8.1	9.7	10.1	10.5	12.6	13.6	15.1	15.8	14.8	13.0	10.3	4.2		
25000	1.6	3.6	4.3	4.4	5.3	3.0	4.5	5.0	5.3	7.3	8.1	9.3	9.7	9.0	7.8	5.2			

TABLE: TONE-CORRECTED, A-WEIGHTED OVERALL SOUND LEVEL (DBA)

AS A FUNCTION OF ANGLE AND DISTANCE FROM SOURCE

IDENTIFICATION:
OMEGA 11.1
TEST 74-004-029
RUN 02
AIRCRAFT CODE 033
OPERATION CODE 96
PROFILE VERSION W
15 MAR 82
PAGE G2

NOISE SOURCE/SUBJECT:
T-38A AIRCRAFT
ENG. J85-GE-5A

OPERATION:
50 % RPM

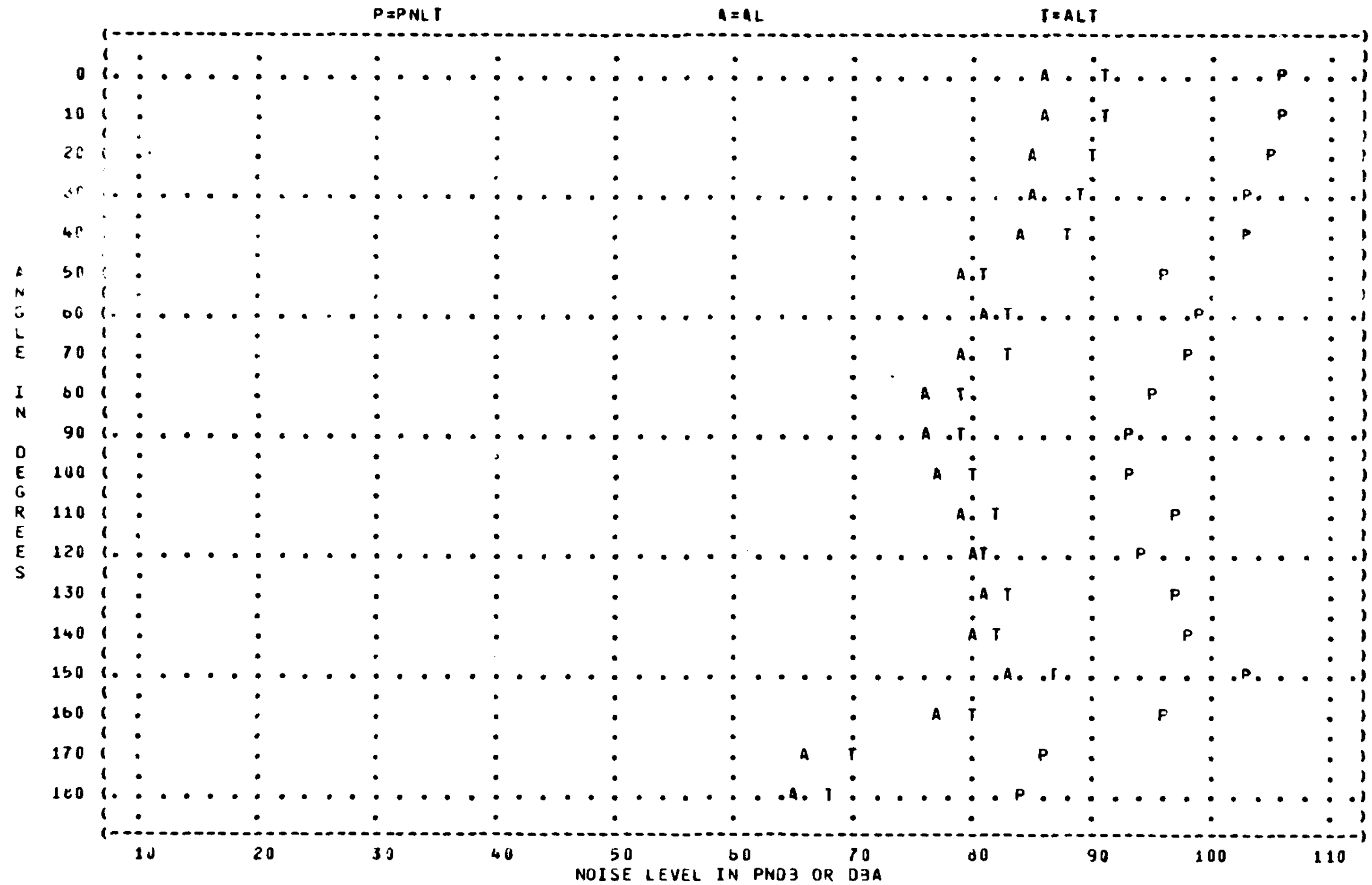
METEOROLOGY:
TEMP = 70 F
BAR PRESS =29.50 IN HG
REL HUMID = 60 %

DISTANCE (FEET)	ANGLE (DEGREES) 0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
200	93.3	93.1	92.1	91.3	90.3	83.5	85.8	85.0	81.7	81.4	81.6	84.2	82.9	84.3	83.9	88.9	82.3	72.0	69.9
250	90.6	90.6	89.6	88.7	87.7	81.1	83.4	82.5	79.4	79.2	79.5	82.0	80.7	82.5	81.6	86.5	80.0	69.6	67.6
315	88.2	88.0	87.0	86.0	85.1	78.5	80.8	80.0	77.1	77.0	77.4	79.8	78.6	80.2	79.3	84.1	77.5	67.1	65.2
400	85.5	85.3	84.2	83.2	82.3	75.8	78.1	77.3	74.7	74.8	75.2	77.5	76.3	77.9	76.9	81.6	75.0	64.5	62.7
500	82.7	82.4	81.3	80.2	79.4	73.1	75.4	74.6	72.3	72.5	72.9	75.2	74.1	75.4	74.5	79.0	72.3	61.3	60.1
630	79.6	79.4	78.3	77.1	76.4	70.3	72.5	71.8	69.8	70.1	70.6	72.8	71.8	72.3	71.9	76.2	69.6	59.0	57.4
800	76.4	76.2	75.0	73.8	73.2	67.4	69.5	68.8	67.2	67.7	68.3	70.4	69.4	70.3	69.3	73.3	66.7	56.1	54.7
1000	73.0	72.8	71.6	70.4	70.0	64.4	66.4	65.8	64.6	65.2	65.8	67.9	67.0	67.7	66.5	70.3	63.6	52.9	51.8
1250	69.3	69.1	68.0	66.8	66.6	61.4	63.2	62.7	61.9	62.6	63.3	65.3	64.5	64.3	63.7	67.0	60.4	49.5	48.7
1600	65.4	65.2	64.2	63.2	63.2	58.2	59.9	59.5	59.0	59.9	60.7	62.7	61.9	62.1	60.7	63.6	57.0	46.0	45.5
2000	61.2	61.1	60.3	59.5	59.7	55.0	56.5	56.3	56.2	57.2	58.0	60.0	59.2	59.3	57.7	60.0	53.6	42.2	42.2
2500	56.8	56.8	56.2	55.5	55.9	51.4	52.8	52.7	52.7	53.9	54.8	56.9	56.2	56.0	54.3	56.1	49.7	38.1	38.5
3150	52.3	52.4	52.0	51.4	51.8	47.5	48.9	48.7	48.9	50.2	51.2	53.4	52.8	52.5	50.5	52.0	45.6	33.8	34.5
4000	46.7	46.8	46.7	46.2	46.7	43.0	44.1	43.8	44.0	45.4	46.7	48.8	48.9	48.2	45.9	46.8	40.6	28.4	29.6
5000	40.8	41.1	41.1	40.7	41.2	38.0	39.0	38.4	38.7	40.3	41.7	43.8	44.4	43.5	40.9	41.2	35.1	22.7	24.3
6300	34.7	35.2	35.3	35.0	35.4	32.7	33.6	32.9	33.2	34.9	36.5	38.6	39.7	38.5	35.7	35.3	29.3	16.8	18.7
8000	28.8	29.9	30.0	29.8	30.3	27.8	28.8	28.4	28.8	30.7	32.2	34.2	35.6	34.2	31.4	30.0	24.1	11.5	13.8
10000	22.8	24.5	24.7	24.6	25.2	22.8	23.9	23.7	24.1	26.3	27.7	29.6	31.1	29.7	26.9	24.7	18.9	6.4	8.9
12500	17.8	19.8	20.0	20.0	20.6	18.0	19.4	19.4	19.9	22.1	23.4	25.2	26.5	25.2	22.5	20.0	14.2	2.2	4.6
16000	12.6	14.8	15.1	15.1	15.9	13.1	14.7	14.9	15.4	17.6	18.7	20.3	21.4	20.2	17.9	15.2	9.3		.3
20000	7.2	9.5	9.9	9.9	10.8	8.1	9.7	10.1	10.5	12.6	13.6	15.1	15.8	14.8	13.0	10.3	4.2		
25000	1.6	3.8	4.3	4.4	5.5	3.0	4.5	5.0	5.3	7.3	8.1	9.3	9.7	9.0	7.8	5.2			

TABLE: NOISE LEVEL AS A FUNCTION OF ANGLE AROUND SOURCE

DISTANCE = 250 FEET

NOISE SOURCE/SUBJECT:	OPERATION:	METEOROLOGY:	IDENTIFICATION:
T-38A AIRCRAFT		TEMP = 70 F	OMEGA 11.1
ENG. J85-GE-5A	50 % RPM	BAR PRESS =29.50 IN HG	TEST 74-004-029
		REL HUMID = 60 %	RUN 02
			AIRCRAFT CODE 033
			OPERATION CODE 96
			PROFILE VERSION W
			15 MAR 82
			PAGE J2



PROFILE DATA WRITTEN ON FILE 'TAPE2' AS FOLLOWS:
PNLT: DATA FOR ANGLES: 0 40 50 50 100 140 150 160 170 180
AL: DATA FOR ANGLES: 0 40 50 50 60 130 150 160 170 180
ALT: DATA FOR ANGLES: 0 40 50 50 60 140 150 160 170 180

TABLE: PERCEIVED NOISE LEVEL (PNDB)

AS A FUNCTION OF ANGLE AND DISTANCE FROM SOURCE

NOISE SOURCE/SUBJECT:	OPERATION:	METEOROLOGY:	IDENTIFICATION:
T-38A AIRCRAFT	MIL PWR	TEMP = 70 F	OMEGA 11.1
ENG. J85-GE-5A	100 % RPM	BAR PRESS =29.50 IN HG	TEST 74-004-029
		REL HUMID = 60 %	RUN 03
			AIRCRAFT CODE 033
			OPERATION CODE 97
			PROFILE VERSION W
			15 MAR 82
			PAGE D3

DISTANCE (FEET)	ANGLE (DEGREES) 0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
200	109.3	110.3	112.8	113.6	114.2	115.5	116.9	117.7	120.1	119.3	122.5	124.5	123.9	129.3	128.2	120.6	106.9	98.0	93.5
250	107.0	108.1	110.6	111.4	112.0	113.2	114.7	115.5	117.9	117.1	120.3	122.3	125.7	127.8	126.1	118.5	104.7	95.8	91.3
315	104.6	105.6	108.3	109.1	109.7	110.9	112.4	113.2	115.6	114.8	118.0	120.1	124.4	125.5	124.0	116.3	102.5	93.6	89.1
400	102.1	103.4	105.9	106.6	107.3	108.6	110.0	110.8	113.2	112.5	115.6	117.7	122.1	123.4	121.8	114.2	100.3	91.3	86.8
500	99.5	101.0	103.5	104.3	104.9	106.1	107.5	108.3	110.7	110.0	113.2	115.3	119.7	121.2	119.5	111.9	98.0	89.0	84.4
630	96.7	98.4	100.9	101.7	102.3	103.5	104.9	105.8	108.2	107.5	110.6	112.8	117.1	118.9	117.2	109.6	95.6	86.5	82.0
800	93.6	95.7	98.2	99.0	99.6	100.7	102.2	103.0	105.4	104.8	107.9	110.1	114.4	116.4	114.8	107.2	93.1	84.0	79.4
1000	90.6	92.9	95.3	96.1	96.7	97.8	99.3	100.1	102.5	102.0	105.1	107.3	111.6	113.3	112.2	104.7	90.5	81.4	76.8
1250	87.2	89.9	92.2	93.0	93.6	94.6	96.1	97.0	99.4	99.0	102.0	104.2	109.6	111.3	109.6	102.1	87.6	78.7	74.0
1500	83.8	86.9	89.0	89.7	90.3	91.2	92.7	93.6	96.0	95.3	98.8	101.0	105.7	108.5	106.8	99.2	84.7	75.7	71.1
2000	80.4	83.8	85.5	86.2	86.8	87.5	89.2	90.0	92.3	92.7	95.2	97.8	102.6	105.5	103.8	96.2	81.5	72.6	67.8
2500	76.9	80.4	81.9	82.3	83.2	83.6	85.3	86.4	88.2	89.3	91.6	94.4	99.2	102.3	100.3	92.4	78.1	69.2	64.2
3150	72.7	76.4	77.8	77.9	79.2	79.3	81.1	82.3	83.8	85.3	87.5	90.4	95.2	98.5	96.4	88.1	74.0	65.0	60.0
4000	68.1	71.9	73.3	73.5	74.7	74.6	76.6	77.8	79.3	80.8	83.1	86.1	90.8	94.2	92.0	83.7	69.5	60.4	55.1
5000	63.1	67.0	68.4	68.5	69.7	69.4	71.7	72.8	74.3	76.1	78.4	81.5	85.9	89.5	87.2	78.9	64.5	55.2	49.5
6300	57.8	61.6	63.1	63.2	64.5	63.3	66.4	67.6	69.0	71.0	73.3	76.5	80.8	84.5	82.3	73.9	59.2	49.8	43.3
8000	53.2	57.4	58.7	58.6	60.1	59.4	61.8	63.2	64.5	66.5	68.6	71.9	76.7	80.7	78.3	70.0	54.9	45.0	38.1
10000	48.2	52.6	53.8	53.6	55.2	54.4	56.6	58.4	59.7	61.9	64.0	67.3	72.2	76.5	74.0	65.9	50.3	39.5	32.5
12500	42.1	47.2	48.4	48.2	49.9	48.9	51.3	53.1	54.5	56.9	58.8	62.3	67.3	72.0	69.4	61.3	44.9	34.0	26.2
16000	35.2	40.6	41.9	41.5	43.6	42.3	45.4	47.3	48.5	51.2	53.2	56.7	61.3	66.3	64.2	56.3	38.6	27.5	17.4
20000	27.4	33.2	34.6	34.0	30.2	34.6	37.4	40.0	41.8	44.8	46.8	50.6	55.9	61.2	58.4	50.5	30.5	17.0	8.5
25000	14.7	24.4	25.3	24.6	26.9	25.1	28.6	31.4	32.8	36.0	39.1	43.1	49.1	54.7	51.8	43.6	19.8	6.4	

TABLE: TONE-CORRECTED, PERCEIVED NOISE LEVEL (PNDB)

AS A FUNCTION OF ANGLE AND DISTANCE FROM SOURCE

NOISE SOURCE/SUBJECT:	OPERATION:	METEOROLOGY:	IDENTIFICATION:
T-38A AIRCRAFT	MIL PWR	TEMP = 70 F	OMEGA 11.1
ENG. J85-GE-5A	100 % RPM	BAR PRESS =29.50 IN HG	TEST 74-004-029
		REL HUMID = 60 %	RUN 03
			AIRCRAFT CODE 033
			OPERATION CODE 97
			PROFILE VERSION W
			15 MAR 82
			PAGE E3

DISTANCE (FEET)	ANGLE (DEGREES) 0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
200	111.5	111.3	113.9	113.6	114.2	115.5	116.9	118.9	120.1	120.6	122.5	124.5	128.9	131.3	128.8	120.6	106.9	98.0	93.5
250	109.2	109.1	111.7	111.4	112.0	113.2	114.7	116.7	117.9	118.4	120.3	122.3	126.7	129.2	126.6	118.5	104.7	95.8	91.3
315	106.8	106.8	109.4	109.1	109.7	110.9	112.4	114.4	115.6	116.1	118.0	120.1	124.4	127.3	124.5	116.3	102.5	93.6	89.1
400	104.4	104.5	107.0	106.6	107.3	108.6	110.0	112.0	113.2	113.8	115.6	117.7	122.1	124.9	122.3	114.2	100.3	91.3	86.8
500	101.8	102.1	104.5	104.3	104.9	106.1	107.5	109.6	110.7	111.3	113.2	115.3	119.7	122.5	120.1	111.9	98.0	89.0	84.4
630	99.0	99.5	102.0	101.7	102.3	103.5	104.9	107.0	108.2	108.8	110.6	112.8	117.1	120.2	117.7	109.6	95.6	86.5	82.0
800	96.0	96.8	99.3	99.0	99.6	100.7	102.2	104.2	105.4	106.1	107.9	110.1	114.4	117.3	115.3	107.2	93.1	84.0	79.4
1000	92.9	94.0	96.4	95.1	96.7	97.8	99.3	101.3	102.5	103.3	105.1	107.3	111.6	115.3	112.8	104.7	90.5	81.4	76.8
1250	89.4	91.0	93.4	93.0	93.6	94.6	96.1	98.2	99.4	100.3	102.0	104.2	108.6	112.7	110.1	102.1	87.6	78.7	74.0
1600	86.1	87.9	90.1	89.7	90.3	91.2	92.7	94.8	96.0	97.2	98.8	101.0	105.7	109.3	107.3	99.2	84.7	75.7	71.1
2000	82.7	84.8	86.6	86.2	86.8	87.5	89.2	91.2	92.3	94.0	95.2	97.8	102.6	107.0	104.4	96.2	81.5	72.6	67.8
2500	79.2	81.4	83.0	82.3	83.2	83.6	85.3	87.6	88.2	90.6	91.6	94.4	99.2	103.7	100.8	92.4	78.1	69.2	64.2
3150	75.0	77.4	73.9	77.9	79.2	79.3	81.1	83.5	83.8	86.6	87.5	90.4	95.2	99.3	96.9	88.1	74.0	65.0	60.0
4000	69.9	72.7	74.2	73.5	74.7	74.6	76.6	78.7	79.3	81.9	83.1	86.1	90.8	95.3	92.4	83.7	69.5	60.4	55.1
5000	64.5	67.6	69.0	68.5	69.7	69.4	71.7	73.6	74.3	76.9	78.4	81.5	85.9	90.3	87.6	78.9	64.5	55.2	49.5
6300	58.7	62.2	63.6	63.2	64.5	63.9	66.4	68.1	69.0	71.6	73.3	76.5	80.8	85.2	82.5	73.9	59.2	49.8	43.3
8000	53.7	57.7	59.0	58.6	60.1	59.4	61.8	63.4	64.5	66.8	68.6	71.9	76.7	81.0	78.4	70.0	54.9	45.0	38.1
10000	48.2	52.6	53.8	53.6	55.2	54.4	56.8	58.4	59.7	61.9	64.0	67.3	72.2	76.5	74.0	65.9	50.3	39.5	32.5
12500	42.1	47.2	48.4	48.2	49.9	48.9	51.3	53.1	54.5	56.9	58.8	62.3	67.3	72.0	69.4	61.3	44.9	34.0	26.2
16000	35.2	40.6	41.9	41.5	43.6	42.3	45.4	47.3	48.5	51.2	53.2	56.7	61.9	66.9	64.2	56.3	38.6	27.5	17.4
20000	27.4	33.2	34.5	34.0	36.2	34.6	37.4	40.0	41.8	44.8	46.8	50.6	55.9	61.2	58.4	50.5	30.5	17.0	8.5
25000	14.7	24.4	23.3	24.6	26.9	25.1	28.8	31.4	32.8	36.0	39.1	43.1	49.1	54.7	51.8	43.6	19.8	6.4	

TABLE: A-WEIGHTED OVERALL SOUND LEVEL (DBA)

AS A FUNCTION OF ANGLE AND DISTANCE FROM SOURCE

IDENTIFICATION:
OMEGA 11.1
TEST 74-004-029
RUN 03
AIRCRAFT CODE 033
OPERATION CODE 97
PROFILE VERSION W
15 MAR 82
PAGE F3

NOISE SOURCE/SUBJECT:
T-38A AIRCRAFT
ENG. J85-GE-5A

OPERATION:
MIL PWR
100 % RPM

METEOROLOGY:
TEMP = 70 F
BAR PRESS =29.50 IN HG
REL HUMID = 60 %

DISTANCE (FEET)	ANGLE (DEGREES) 0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
200	95.1	97.9	100.0	100.7	101.3	102.1	103.8	104.6	106.7	107.0	109.9	[illegible]	116.4	118.5	116.7	107.8	94.3	86.0	80.5
250	92.9	95.8	97.8	98.5	99.2	99.9	101.6	102.4	104.5	104.9	107.7	110.2	114.2	116.5	114.6	105.8	92.2	83.9	78.5
315	90.6	93.6	95.6	96.3	97.0	97.7	99.4	100.2	102.3	102.7	105.5	108.1	112.1	114.5	112.5	103.7	90.1	81.8	76.4
400	88.3	91.4	93.4	94.0	94.7	95.4	97.1	98.0	100.0	100.5	103.3	105.9	109.9	112.4	110.4	101.6	88.0	79.7	74.2
500	86.0	89.2	91.1	91.7	92.4	93.1	94.8	95.6	97.6	98.3	101.0	103.6	107.6	110.2	108.2	99.5	85.8	77.5	72.1
630	83.5	86.9	88.8	89.3	90.1	90.6	92.4	93.3	95.2	96.0	98.6	101.4	105.3	108.0	106.0	97.3	83.6	75.4	69.9
800	81.1	84.5	86.4	86.9	87.7	88.1	89.9	90.8	92.7	93.6	96.2	99.0	103.0	105.8	103.7	95.0	81.3	73.1	67.6
1000	78.5	82.1	83.9	84.4	85.2	85.5	87.4	88.3	90.1	91.2	93.7	96.6	100.5	103.5	101.4	92.7	79.0	70.8	65.3
1250	75.9	79.6	81.3	81.7	82.6	82.8	84.7	85.6	87.4	88.6	91.1	94.1	98.0	101.2	99.0	90.3	76.5	68.4	62.8
1600	73.1	76.9	78.6	79.0	79.8	80.0	81.9	82.9	84.6	85.0	88.5	91.4	95.4	98.7	96.5	87.8	74.0	65.9	60.3
2000	70.3	74.2	75.8	76.1	77.0	77.1	79.1	80.0	81.7	83.3	85.7	88.7	92.7	96.2	93.9	85.2	71.3	63.3	57.6
2500	67.2	71.2	72.7	73.1	74.0	73.9	76.0	77.0	78.5	80.3	82.6	85.7	89.7	93.3	90.9	82.1	68.3	60.4	54.6
3150	63.6	67.9	69.3	69.7	70.6	70.4	72.6	73.5	75.0	77.0	79.3	82.4	86.4	90.1	87.5	78.6	65.0	57.1	51.3
4000	60.1	64.2	65.6	65.9	66.8	66.6	68.8	69.8	71.2	73.3	75.6	78.8	82.7	86.4	83.8	74.7	61.3	53.4	47.5
5000	55.8	60.0	61.3	61.7	62.6	62.3	64.6	65.6	66.9	69.1	71.4	74.6	78.5	82.3	79.6	70.3	57.1	49.2	43.2
6300	51.2	55.4	56.8	57.1	58.0	57.6	59.9	61.0	62.3	64.6	66.9	70.1	73.9	77.9	75.1	65.7	52.6	44.7	38.7
8000	47.0	51.3	52.5	52.8	53.7	53.2	55.6	56.7	57.9	60.4	62.6	65.9	69.8	74.0	71.1	62.1	48.7	40.6	34.8
10000	42.5	46.8	47.9	48.2	49.2	48.4	51.0	52.0	53.2	55.8	58.0	61.2	65.4	69.7	66.7	58.0	44.3	36.6	30.7
12500	37.6	42.0	42.3	43.1	44.2	43.3	46.0	47.0	48.1	50.8	52.9	56.2	60.5	65.1	61.9	53.7	39.6	32.0	26.1
16000	32.2	36.7	37.4	37.6	38.8	37.7	40.5	41.5	42.6	45.4	47.4	50.6	55.2	59.3	56.7	48.8	34.5	26.8	21.2
20000	26.4	30.8	31.4	31.6	32.8	31.7	34.5	35.6	36.7	39.4	41.3	44.5	49.3	54.2	51.0	43.5	28.8	21.1	15.7
25000	20.0	24.3	24.8	24.9	26.2	25.1	27.7	29.0	30.1	32.8	34.5	37.8	42.8	47.3	44.8	37.7	22.8	14.8	9.9

TABLE: TONE-CORRECTED, A-WEIGHTED OVERALL SOUND LEVEL (DBA)

AS A FUNCTION OF ANGLE AND DISTANCE FROM SOURCE

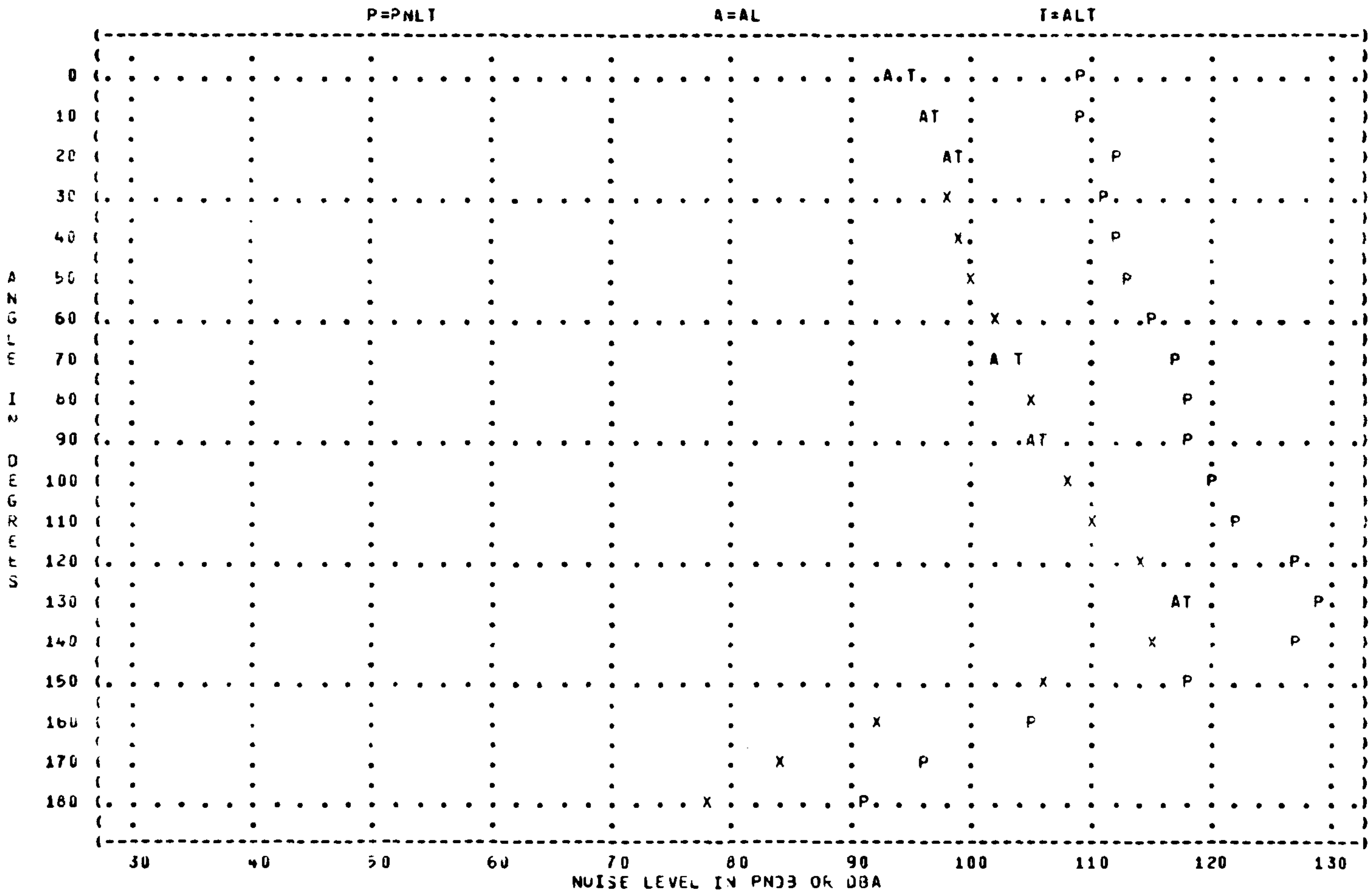
NOISE SOURCE/SUBJECT:	OPERATION:	METEOROLOGY:	IDENTIFICATION:
T-38A AIRCRAFT ENG. J85-GE-5A	MIL PWR 100 % RPM	TEMP = 70 F BAR PRESS =29.50 IN HG REL HUMID = 60 %	OMEGA 11.1 TEST 74-004-029 RUN 03 AIRCRAFT CODE 033 OPERATION CODE 97 PROFILE VERSION W 15 MAR 82 PAGE G3

DISTANCE (FEET)	ANGLE (DEGREES) 0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
200	97.4	99.0	101.1	100.7	101.3	102.1	103.8	105.6	106.7	108.3	109.9	112.4	116.4	120.0	117.2	107.8	94.3	86.0	80.5
250	95.1	96.8	99.0	98.5	99.2	99.9	101.6	103.7	104.5	106.2	107.7	110.2	114.2	117.3	115.2	105.8	92.2	83.9	78.5
315	92.9	94.7	96.8	96.3	97.0	97.7	99.4	101.4	102.3	104.0	105.5	108.1	112.1	115.3	113.0	103.7	90.1	81.8	76.4
400	90.6	92.5	94.5	94.0	94.7	95.4	97.1	99.2	100.0	101.8	103.3	105.9	109.9	113.7	110.9	101.6	88.0	79.7	74.2
500	88.2	90.2	92.2	91.7	92.4	93.1	94.8	96.9	97.6	99.6	101.0	103.6	107.6	111.5	108.7	99.5	85.8	77.6	72.1
630	85.6	87.9	89.9	89.3	90.1	90.6	92.4	94.5	95.2	97.3	98.6	101.4	105.3	109.4	106.5	97.3	83.6	75.4	69.9
800	83.3	85.6	87.5	86.9	87.7	88.1	89.9	92.0	92.7	94.9	96.2	99.0	103.0	107.2	104.3	95.0	81.3	73.1	67.5
1000	80.8	83.1	85.0	84.4	85.2	85.5	87.4	89.5	90.1	92.5	93.7	96.6	100.5	104.3	101.9	92.7	79.0	70.8	65.3
1250	78.1	80.6	82.4	81.7	82.6	82.8	84.7	86.8	87.4	89.9	91.1	94.1	98.0	102.5	99.5	90.3	76.5	68.4	62.8
1600	75.4	78.0	79.7	79.0	79.8	80.0	81.9	84.1	84.6	87.3	88.5	91.4	95.4	100.1	97.0	87.8	74.0	65.9	60.3
2000	72.6	75.3	76.9	76.1	77.0	77.1	79.1	81.3	81.7	84.6	85.7	88.7	92.7	97.5	94.4	85.2	71.3	63.3	57.6
2500	69.5	72.3	73.8	73.1	74.0	73.9	76.0	78.2	78.5	81.6	82.6	85.7	89.7	94.7	91.4	82.1	68.3	60.4	54.6
3150	66.1	69.0	70.4	69.7	70.6	70.4	72.6	74.8	75.0	78.3	79.3	82.4	86.4	91.4	88.0	78.6	65.0	57.1	51.3
4000	61.9	65.0	66.4	65.9	66.8	66.6	68.8	70.8	71.2	74.3	75.6	78.8	82.7	87.5	84.2	74.7	61.3	53.4	47.5
5000	57.2	60.6	62.0	61.7	62.6	62.3	64.6	66.3	66.9	69.9	71.4	74.6	78.5	83.1	79.9	70.3	57.1	49.2	43.2
6300	52.1	55.8	57.2	57.1	58.0	57.6	59.9	61.5	62.3	65.1	66.9	70.1	73.9	78.4	75.3	65.7	52.6	44.7	38.7
8000	47.5	51.5	52.7	52.8	53.7	53.2	55.6	56.9	57.9	60.7	62.6	65.9	69.8	74.3	71.2	62.1	48.7	40.8	34.8
10000	42.5	46.8	47.9	48.2	49.2	48.4	51.0	52.0	53.2	55.3	58.0	61.2	65.4	69.7	66.7	58.0	44.3	36.6	30.7
12500	37.6	42.0	42.9	43.1	44.2	43.3	46.0	47.0	48.1	50.8	52.9	56.2	60.5	65.1	61.9	53.7	39.6	32.0	26.1
16000	32.2	36.7	37.4	37.6	38.8	37.7	40.5	41.5	42.5	45.4	47.4	50.6	55.2	59.3	56.7	48.8	34.5	26.8	21.2
20000	26.4	30.6	31.4	31.6	32.8	31.7	34.5	35.6	36.7	39.4	41.3	44.5	49.3	54.2	51.0	43.5	28.8	21.1	15.7
25000	20.0	24.3	24.8	24.9	26.2	25.1	27.7	29.0	30.1	32.8	34.5	37.8	42.8	47.8	44.8	37.7	22.8	14.8	9.9

TABLE: NOISE LEVEL AS A FUNCTION OF ANGLE AROUND SOURCE

DISTANCE = 250 FEET

NOISE SOURCE/SUBJECT:	OPERATION:	METEOROLOGY:	IDENTIFICATION:
T-38A AIRCRAFT	MIL PWR	TEMP = 70 F	OMEGA 11.1
ENG. J85-GE-5A	100 % RPM	BAR PRESS =29.50 IN HG	TEST 74-004-029
		REL HUMID = 60 %	RUN 03
			AIRCRAFT CODE 033
			OPERATION CODE 97
			PROFILE VERSION W
			15 MAR 82
			PAGE J3



PROFILE DATA WRITTEN ON FILE 'TAPE2' AS FOLLOWS:
PNLT: DATA FOR ANGLES: 0 90 110 120 130 140 150 160 170 180
AL: DATA FOR ANGLES: 0 20 70 110 130 140 150 160 170 180
ALT: DATA FOR ANGLES: 0 90 110 120 130 140 150 160 170 180

END OF OMEGA11 JOB

OMEGA 11 PROFILE DATASET OUTPUT FILE (FILE TAPE2):

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*COMDECK P03395W0
PNLT       03395       0   114.0   111.7   109.3   106.9   104.4   101.7          1
COMMENT  03395W0 OMEGA11.1 15 MAR 82   70 F   60 PCT  29.50 IN HG   74-004-029 01
COMMENT  03395W0 T-38A       AIRCRAFT          ENG. J85-GE-5A          N03303A0
COMMENT  03395W0  MAX PWR A/B                  100 % RPM
            99.0    96.3    93.4    90.4    87.1    83.6    79.5    74.4          2
            66.9    63.2    58.3    53.3    48.2    42.2    35.0    25.4          3
           03395      60   118.5   116.3   114.2   111.9   109.6   107.2          4
           104.8   102.2    99.4    96.5    93.4    90.0    86.1    81.5          5
            76.6    71.4    67.1    62.6    57.7    52.5    46.2    38.4          6
           03395      80   121.5   119.3   117.0   114.8   112.5   110.1          7
           107.6   105.0   102.2    99.3    96.2    92.8    88.8    84.1          8
            79.0    73.7    69.3    64.7    59.8    54.4    48.4    40.8          9
           03395      90   125.6   123.4   121.2   118.9   116.5   114.0         10
           111.4   108.7   106.0   103.0    99.9    96.5    92.6    87.9         11
            82.8    77.5    73.1    68.4    63.5    58.1    52.1    45.0         12
           03395     100   126.2   124.0   121.8   119.6   117.3   114.9         13
           112.4   109.8   107.1   104.2   101.2    97.9    93.9    89.6         14
            84.8    79.8    75.8    71.5    66.7    61.4    55.5    48.8         15
           03395     120   137.9   135.8   133.6   131.4   129.2   126.8         16
           124.4   121.9   119.3   116.5   113.6   110.3   106.5   102.0         17
            97.0    91.9    87.8    83.3    78.8    73.8    68.2    61.8         18
           03395     140   137.1   135.0   132.9   130.7   128.4   126.1         19
           123.7   121.2   118.6   115.8   112.9   109.6   105.8   101.2         20
            96.2    91.0    86.9    82.5    78.1    73.1    67.6    61.4         21
           03395     150   130.0   127.9   125.8   123.6   121.4   119.1         22
           116.7   114.2   111.6   108.8   105.8   102.5    98.6    94.2         23
            89.5    84.6    80.8    76.7    72.2    67.3    61.7    55.4         24
           03395     160   101.1    98.9    96.8    94.5    92.1    89.7         25
            87.1    84.4    81.6    78.6    75.4    71.8    67.6    62.8         26
            57.6    51.9    47.4    42.3    36.5    29.2    19.4     9.7         27
           03395     180    95.3    93.1    90.8    88.4    86.0    83.4         28
            80.6    78.1    75.3    72.2    69.0    65.4    61.1    56.2         29
            50.6    44.6    39.3    33.4    26.6    16.0     9.4      .8
*COMDECK A03395W0
AL         03395       0    97.3    95.1    92.9    90.7    88.4    86.1          1
COMMENT  03395W0 OMEGA11.1 15 MAR 82   70 F   60 PCT  29.50 IN HG   74-004-029 01
COMMENT  03395W0 T-38A       AIRCRAFT          ENG. J85-GE-5A          N03303A0
COMMENT  03395W0  MAX PWR A/B                  100 % RPM
            63.7    81.3    76.8    76.2    73.5    70.5    67.1    63.3          2
            59.0    54.5    50.6    46.4    41.6    36.8    31.3    25.3          3
           03395      60   105.3   103.2   101.1    99.0    96.6    94.6          4
            92.3    89.9    87.5    85.0    82.4    79.5    75.2    72.5          5
            68.3    63.7    59.9    55.6    51.0    45.5    40.2    33.9          6
           03395      70   109.0   106.8   104.7   102.5   100.3    98.0          7
            95.7    93.3    90.8    88.2    85.5    82.6    79.3    75.5          8
            71.4    67.0    62.9    58.5    53.7    48.5    42.6    36.2          9
           03395      80   108.0   105.9   103.8   101.6    99.4    97.1         10
            94.8    92.4    89.9    87.4    84.7    81.7    78.3    74.6         11
            70.3    65.6    61.8    57.4    52.7    47.5    41.8    35.5         12
           03395     100   114.6   112.5   110.3   109.2   105.0   103.7         13
           101.5    99.1    96.7    94.2    91.5    88.8    85.5    81.9         14
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      77.8    73.3    69.3    64.9    60.1    54.8    49.0    42.4       15
     03395     120   125.0   122.9   120.8   118.7   116.5   114.3       16
     112.1   109.8   107.4   105.0   102.5    99.7    96.4    92.7       17
      88.5    84.0    80.2    76.1    71.6    66.5    60.9    54.5       18
     03395     130   126.9   124.8   122.7   120.6   118.4   116.2       19
     114.0   111.7   109.3   106.9   104.3   101.4    98.2    94.5       20
      90.4    85.9    82.0    77.7    73.0    67.8    61.9    55.5       21
     03395     150   118.1   116.1   114.0   111.9   109.7   107.5       22
     105.3   103.0   100.5    98.1    95.5    92.6    89.2    85.5       23
      81.2    76.7    72.9    68.8    64.2    59.2    53.7    47.5       24
     03395     160    87.8    85.7    83.6    81.5    79.3    77.1       25
      74.6    72.4    69.9    67.2    64.5    61.4    58.0    54.1       26
      49.8    45.2    41.4    37.3    32.9    28.0    22.8    17.2       27
     03395     160    81.9    79.8    77.7    75.6    73.3    71.0       28
      68.7    66.3    63.7    61.1    58.3    55.3    51.6    48.0       29
      43.7    39.1    35.2    31.0    26.4    21.4    16.0    10.2
*COMDECK T03395W0
ALT  03395       0    99.8    97.7    95.5    93.3    91.0    88.7        1
COMMENT 03395W0 OMEGA11.1 15 MAR 82  70 F  60 PCT  29.50 IN HG  74-004-029 01
COMMENT 03395W0 T-38A     AIRCRAFT        ENG. J85-GE-5A           N03303A0
COMMENT 03395W0  MAX PWR A/B              100 % RPM
      86.3    83.9    81.4    78.8    76.1    73.1    69.7    65.4        2
      60.6    55.5    51.1    46.4    41.8    36.8    31.3    25.3        3
     03395      60   106.1   104.0   101.3    99.7    97.5    95.3        4
      93.0    90.7    88.2    85.7    83.1    80.2    76.9    73.1        5
      68.7    64.0    60.0    55.6    51.0    45.9    40.2    33.9        6
     03395      80   109.2   107.1   104.9   102.7   100.5    98.3        7
      95.9    93.5    91.1    88.5    85.8    82.8    79.5    75.5        8
      71.0    66.3    62.0    57.4    52.7    47.5    41.8    35.5        9
     03395      90   113.3   111.2   109.1   106.9   104.7   102.4       10
     100.0    97.6    95.1    92.5    89.8    86.8    83.4    79.4       11
      75.0    70.2    65.8    61.1    56.3    51.1    45.3    38.9       12
     03395     100   114.6   112.5   110.3   108.2   105.0   103.7       13
     101.5    99.1    96.7    94.2    91.6    88.6    85.6    81.9       14
      77.8    73.3    69.3    64.9    60.1    54.8    49.0    42.4       15
     03395     120   126.2   124.1   122.0   119.9   117.7   115.5       16
     113.3   111.0   108.6   106.2   103.7   100.9    97.6    93.7       17
      89.2    84.5    80.5    76.1    71.6    66.5    60.9    54.5       18
     03395     140   125.0   123.0   120.9   118.8   116.6   114.4       19
     112.2   110.0   107.6   105.2   102.7    99.9    96.5    92.5       20
      86.0    83.2    79.2    74.8    70.3    65.4    59.8    53.5       21
     03395     150   118.1   116.1   114.0   111.9   109.7   107.5       22
     105.3   103.0   100.5    98.1    95.5    92.6    89.2    85.5       23
      81.2    76.7    72.9    68.8    64.2    59.2    53.7    47.5       24
     03395     160    87.8    85.7    83.6    81.5    79.3    77.1       25
      74.6    72.4    69.9    67.2    64.5    61.4    58.0    54.1       26
      49.6    45.2    41.4    37.3    32.9    28.0    22.8    17.2       27
     03395     160    81.9    79.8    77.7    75.6    73.3    71.0       28
      64.7    66.3    63.7    61.1    58.3    55.3    51.8    48.0       29
      43.7    39.1    35.2    31.0    26.4    21.4    16.0    10.2
*COMDECK P03395W0
PNLT 03396       0   108.3   105.9   103.4   100.8    98.0    95.1        1
COMMENT 03396W0 OMEGA11.1 15 MAR 82  70 F  60 PCT  29.50 IN HG  74-004-029 02
COMMENT 03396W0 T-38A     AIRCRAFT        ENG. J85-GE-5A       N03313A0-21A0
COMMENT 03396W0                           50 % RPM
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          91.9      88.4      84.6      80.4      75.7      70.3      64.1      56.6           2
          49.0      39.4      29.3      17.2       7.3      -2.7     -12.6     -22.6           3
         03396        40     105.0     102.6     100.2      97.6      94.8      91.9           4
          86.7      85.3      81.6      77.4      72.3      67.7      62.5      56.3           5
          46.7      40.0      33.2      24.3      14.9       5.4      -4.0     -13.5           6
         03396        50      98.4      95.9      93.2      90.4      87.6      84.7           7
          81.6      78.3      74.8      71.2      67.2      62.6      57.8      52.1           8
          45.0      36.4      27.9      15.9       4.2      -7.5     -19.2     -30.9           9
         03396        60     101.3      99.0      96.5      93.9      91.2      88.3          10
          85.2      81.8      76.1      74.0      69.5      64.2      58.8      52.6          11
          45.3      36.9      30.3      20.8      10.1       -.7     -11.4     -22.2          12
         03396       100      95.3      93.0      90.8      88.3      85.9      83.4          13
          80.7      77.9      75.0      72.0      68.7      64.5      59.9      54.4          14
          48.2      41.2      34.9      29.0      21.6      12.4       3.2      -6.0          15
         03396       140      99.9      97.6      95.2      92.7      90.0      87.2          16
          84.2      80.9      77.4      73.5      69.9      65.6      60.7      55.1          17
          48.7      41.3      34.8      27.4      19.4       9.7       -.0      -9.7          18
         03396       150     105.0     102.7     100.2      97.7      95.0      92.2          19
          89.1      85.8      82.2      78.2      73.8      68.7      62.8      56.7          20
          49.5      40.6      32.2      21.2      12.3       3.3      -5.6     -14.5          21
         03396       160      98.2      95.9      93.4      90.9      88.1      85.3          22
          82.2      78.8      75.1      71.0      66.4      61.0      55.2      48.2          23
          40.5      30.3      20.6      10.6       1.1      -8.4     -17.8     -27.3          24
         03396       170      96.3      85.9      83.4      80.6      78.0      75.1          25
          71.9      68.3      64.5      60.1      55.0      46.6      39.9      23.9          26
          15.2        .6     -14.1     -28.6     -42.7     -56.6     -70.6     -84.5          27
         03396       180      86.1      83.7      81.2      78.6      75.9      73.0          28
          69.8      66.4      62.6      58.3      53.3      47.7      40.5      31.8          29
          19.5       7.1      -5.2     -17.5     -29.3     -41.1     -52.9     -64.7
*COMDECK A03396H0
AL       03396         0      88.1      85.7      83.1      80.4      77.5      74.5           1
COMMENT  03396H0 OMEGA11.1 15 MAR 82  70 F  60 PCT  29.50 IN HG   74-004-029 02
COMMENT  03396H0 T-38A     AIRCRAFT           ENG. J85-GE-5A            N03313A0-21A0
COMMENT  03396H0                              50 % RPM
          71.3      67.8      64.1      60.2      56.0      51.7      47.2      42.6           2
          37.7      32.6      27.8      22.8      17.8      12.6       7.2       1.6           3
         03396        40      86.6      84.1      81.4      78.7      75.8      72.7           4
          69.6      66.3      62.9      59.5      56.0      52.2      48.1      43.7           5
          39.0      33.9      29.6      25.2      20.6      15.9      10.8       5.8           6
         03396        50      81.9      79.4      76.9      74.2      71.5      68.6           7
          65.8      62.8      59.7      56.6      53.4      49.6      45.9      41.7           8
          37.1      32.1      27.5      22.8      18.0      13.1       8.1       3.0           9
         03396        60      83.0      80.5      77.9      75.3      72.5      69.6          10
          66.6      63.5      60.3      57.0      53.6      50.0      46.0      41.8          11
          37.3      32.4      28.2      23.9      19.4      14.7       9.7       4.5          12
         03396        80      77.9      75.7      73.4      71.6      58.6      66.1          13
          63.5      60.9      58.1      55.3      52.4      49.0      45.2      41.0          14
          36.4      31.7      28.0      24.1      19.9      15.4      10.5       5.3          15
         03396       130      83.2      80.9      78.6      76.2      73.8      71.3          16
          68.7      66.1      63.4      60.6      57.7      54.5      50.9      47.0          17
          42.5      37.9      33.9      29.7      25.2      20.2      14.6       9.0          18
         03396       150      85.0      82.7      80.2      77.7      75.1      72.4          19
          69.5      66.4      63.2      59.7      56.2      52.3      48.1      43.7          20
          38.9      33.6      29.3      24.7      20.0      15.2      10.3       5.2          21
         03396       160      78.9      76.5      74.1      71.5      53.9      66.1          22
```

```
        63.2     60.1     56.9     53.0     50.1     46.3     42.2     37.8         23
        33.6     27.9     23.4     18.9     14.2      9.3      4.2     -1.2         24
       03396      170     68.3     65.9     63.4     60.6     58.2     55.3         25
        52.4     49.2     45.8     42.3     38.5     34.4     30.1     25.5         26
        20.5     15.3     10.6      6.4      2.2     -1.9     -6.0     -9.8         27
       03396      180     67.2     64.9     62.5     60.0     57.4     54.8         28
        52.0     49.1     46.0     42.8     39.5     35.8     31.8     27.4         29
        22.7     17.6     13.2      8.9      4.6       .3     -3.8     -7.6
*COMDECK T03396W0
ALT    03396        0     93.3     90.8     88.2     85.5     82.7     79.6          1
COMMENT 03396W0 OMEGA11.1 15 MAR 82  70 F  60 PCT  29.50 IN HG   74-004-029 02
COMMENT 03396W0 T-38A     AIRCRAFT         ENG. J85-GE-5A          N03313A0-21A0
COMMENT 03396W0                            50 % RPM
        76.4     73.0     69.3     65.4     61.2     56.6     52.3     46.7          2
        40.8     34.7     28.8     22.8     17.8     12.6      7.2      1.6          3
       03396       40     90.3     87.7     85.1     82.3     79.4     76.4          4
        73.2     70.0     66.6     63.2     59.7     55.9     51.8     46.7          5
        41.2     35.4     30.3     25.2     20.6     15.9     10.8      5.3          6
       03396       50     83.5     81.1     78.5     75.8     73.1     70.3          7
        67.4     64.4     61.4     58.2     55.0     51.4     47.5     43.0          8
        38.0     32.7     27.8     22.6     18.0     13.1      8.1      3.0          9
       03396       60     85.8     83.4     80.8     78.1     75.4     72.5         10
        69.5     66.4     63.2     59.9     56.5     52.8     48.9     44.1         11
        39.0     33.6     28.8     23.9     19.4     14.7      9.7      4.5         12
       03396       80     81.7     79.4     77.1     74.7     72.3     69.8         13
        67.2     64.6     61.9     59.0     56.2     52.7     48.9     44.0         14
        38.7     33.2     28.8     24.1     19.9     15.4     10.5      5.3         15
       03396      140     83.9     81.6     79.3     76.9     74.5     71.9         16
        69.3     66.5     63.7     60.7     57.7     54.3     50.5     45.9         17
        40.9     35.7     31.4     26.9     22.5     17.9     13.0      7.8         18
       03396      150     88.9     86.5     84.1     81.6     79.0     76.2         19
        73.3     70.3     67.0     63.6     60.0     56.1     52.0     46.8         20
        41.2     35.3     30.0     24.7     20.0     15.2     10.3      5.2         21
       03396      160     82.3     80.0     77.5     75.0     72.3     69.6         22
        66.7     63.6     60.4     57.0     53.6     49.7     45.5     40.5         23
        35.1     29.3     24.1     18.9     14.2      9.3      4.2     -1.2         24
       03396      170     72.0     69.6     67.1     64.5     61.9     59.0         25
        56.1     52.9     49.5     46.0     42.2     38.1     33.6     28.4         26
        22.7     16.8     11.5      6.4      2.2     -1.9     -6.0     -9.8         27
       03396      180     69.9     67.6     65.2     62.7     60.1     57.4         28
        54.7     51.8     48.7     45.5     42.2     38.5     34.5     29.6         29
        24.3     18.7     13.8      8.9      4.6       .3     -3.8     -7.8
*COMDECK P03397W0
PNLT   03397        0    111.5    109.2    106.8    104.4    101.6     99.0          1
COMMENT 03397W0 OMEGA11.1 15 MAR 82  70 F  60 PCT  29.50 IN HG   74-004-029 03
COMMENT 03397W0 T-38A     AIRCRAFT         ENG. J85-GE-5A          N03304A0
COMMENT 03397W0  MIL PWR                  100 % RPM
        96.0     92.9     89.4     86.1     82.7     79.2     75.0     69.9          2
        64.5     58.7     53.7     48.2     42.1     35.2     27.4     14.7          3
       03397       90    120.6    118.4    116.1    113.6    111.3    108.8          4
       106.1    103.3    100.3     97.2     94.0     90.6     85.5     81.9          5
        76.9     71.6     66.8     61.5     56.9     51.2     44.8     36.0          6
       03397      110    124.5    122.3    120.1    117.7    115.3    112.8          7
       110.1    107.3    104.2    101.0     97.8     94.4     90.4     86.1          8
        81.5     76.5     71.9     67.3     62.3     56.7     50.6     43.1          9
```

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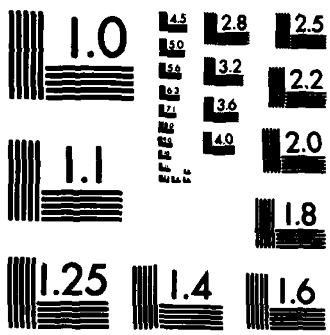
         03397     120   128.9   126.7   124.4   122.1   119.7   117.1        10
         114.4   111.6   108.6   105.7   102.6    93.2    95.2    30.8        11
          85.9    80.8    76.7    72.2    67.3    61.9    55.9    49.1        12
         03397     138   131.3   129.2   127.0   124.6   122.6   120.2        13
         117.8   115.3   112.7   109.9   107.0   103.7    99.9    95.3        14
          90.3    85.2    81.0    76.6    72.0    66.9    61.2    54.7        15
         03397     140   126.8   126.6   124.5   122.3   120.1   117.7        16
         115.3   112.8   110.1   107.3   104.4   100.8    96.9    92.4        17
          87.6    82.5    78.4    74.0    69.4    64.2    58.4    51.6        18
         03397     150   120.6   118.5   116.3   114.2   111.3   109.6        19
         107.2   104.7   102.1    99.2    96.2    92.4    88.1    93.7        20
          78.9    73.9    70.0    65.9    61.3    56.3    50.5    43.6        21
         03397     160   106.9   104.7   102.5   100.3    98.0    95.6        22
          93.1    90.5    87.6    84.7    81.5    78.1    74.0    69.5        23
          64.5    59.2    54.9    50.3    44.9    38.6    30.5    19.8        24
         03397     170    96.0    95.8    93.6    91.3    89.0    86.5        25
          64.0    61.4    78.7    75.7    72.6    69.2    65.0    60.4        26
          55.2    49.8    45.0    39.5    34.0    27.5    17.0     6.4        27
         03397     180    93.5    91.3    89.1    85.8    84.4    82.0        28
          79.4    76.8    74.0    71.1    67.8    64.2    60.0    55.1        29
          49.5    43.3    38.1    32.5    26.2    17.4     8.5     -.3
*COMDECK A03397W0
AL       03397       0    95.1    92.9    90.6    88.3    86.0    83.5         1
COMMENT  03397W0 OMEGA11.1 15 MAR 32  70 F  60 PCT  29.50 IN HG   74-004-029 03
COMMENT  03397W0 T-38A     AIRCRAFT       ENG. J85-GE-5A            N03304A0
COMMENT  03397W0  MIL PWR                100 % RPM
          81.1    78.5    75.9    73.1    70.3    67.2    63.8    60.1         2
          55.8    51.2    47.0    42.5    37.6    32.2    26.4    20.0         3
         03397      20   100.0    97.8    95.6    93.4    91.1    88.8         4
          86.4    83.9    81.3    78.6    75.8    72.7    69.3    65.6         5
          61.3    56.8    52.5    47.9    42.9    37.4    31.4    24.8         6
         03397      70   104.6   102.4   100.2    98.0    95.6    93.3         7
          90.8    88.3    85.6    82.9    80.0    77.0    73.5    69.8         8
          65.6    61.0    56.7    52.0    47.0    41.5    35.6    29.0         9
         03397     110   112.4   110.2   108.1   105.9   103.6   101.4        10
          99.0    96.6    94.1    91.4    88.7    85.7    82.4    78.8        11
          74.6    70.1    65.9    61.2    56.2    50.6    44.5    37.8        12
         03397     130   118.6   116.6   114.5   112.4   110.2   108.0        13
         105.8   103.5   101.2    98.7    96.2    93.3    90.1    86.4        14
          82.3    77.8    74.0    69.7    65.1    59.9    54.2    47.8        15
         03397     140   116.7   114.6   112.5   110.4   108.2   106.0        16
         103.7   101.4    99.0    96.5    93.9    90.9    87.5    83.8        17
          79.6    75.1    71.1    66.7    61.9    56.7    51.0    44.8        18
         03397     150   107.8   105.8   103.7   101.6    99.5    97.3        19
          95.0    92.7    90.3    87.8    85.2    82.1    78.6    74.7        20
          70.3    65.7    62.1    58.0    53.7    48.8    43.5    37.7        21
         03397     160    94.3    92.2    90.1    88.0    85.8    83.6        22
          81.3    79.0    76.5    74.0    71.3    68.3    65.0    61.3        23
          57.1    52.6    48.7    44.3    33.6    34.5    28.8    22.8        24
         03397     170    86.0    63.9    81.8    79.7    77.6    75.4        25
          73.1    70.8    66.4    65.9    63.3    60.4    57.1    53.4        26
          49.2    44.7    40.8    36.6    32.0    26.6    21.1    14.8        27
         03397     180    80.5    76.5    76.4    74.2    72.1    69.9        28
          67.6    65.3    62.8    60.3    57.5    54.6    51.3    47.5        29
          43.2    38.7    34.8    30.7    26.1    21.2    15.7     9.9
```

AD-A127 419 COMPUTER PROGRAMS FOR PRODUCING SINGLE-EVENT AIRCRAFT 3/5
NOISE DATA FOR SPEC..(U) DAYTON UNIV OH RESEARCH INST
H T MOHLMAN APR 83 UDR-TR-82-30 AFAMRL-TR-83-020
UNCLASSIFIED F33615-78-C-0500 F/G 9/2 NL



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

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*CONDECK T03397W0
ALT      03397        0     97.4     95.1     92.9     90.6     88.2     85.8          1
COMMENT  03397W0 OMEGA11.1 15 MAR 82  70 F  60 PCT  29.50 IN HG   74-004-029 03
COMMENT  03397W0 T-38A      AIRCRAFT           ENG. J85-GE-5A           N03304A0
COMMENT  03397W0  MIL PWR                     100 % RPM
            63.3     80.8     78.1     75.4     72.6     69.5     66.1     61.9          2
            57.2     52.1     47.5     42.5     37.6     32.2     26.4     20.0          3
           03397       90    108.3    106.2    104.0    101.6     99.6     97.3          4
            94.9     92.5     89.9     87.3     84.6     81.6     78.3     74.3          5
            69.9     65.1     60.7     55.8     50.8     45.4     39.4     32.8          6
           03397      110    112.4    110.2    108.1    105.9    103.6    101.4          7
            99.0     96.6     94.1     91.4     88.7     85.7     82.4     78.8          8
            74.6     70.1     65.9     61.2     56.2     50.6     44.5     37.8          9
           03397      120    116.4    114.2    112.1    109.9    107.6    105.3         10
           103.0    100.5     98.0     95.4     92.7     89.7     86.4     82.7         11
            78.5     73.9     69.8     65.4     60.5     55.2     49.3     42.8         12
           03397      130    120.0    117.9    115.9    113.7    111.6    109.4         13
           107.2    104.9    102.6    100.1     97.6     94.7     91.4     87.5         14
            83.1     78.4     74.3     69.7     65.1     59.9     54.2     47.8         15
           03397      140    117.2    115.2    113.0    110.9    108.7    106.5         16
           104.3    101.9     99.5     97.0     94.4     91.4     88.0     84.2         17
            79.9     75.3     71.2     66.7     61.9     56.7     51.0     44.8         18
           03397      150    107.8    105.6    103.7    101.6     99.5     97.3         19
            95.0     92.7     90.3     87.8     85.2     82.1     78.6     74.7         20
            70.3     65.7     62.1     58.0     53.7     48.8     43.5     37.7         21
           03397      160     94.3     92.2     90.1     88.0     85.8     83.6         22
            81.3     79.0     76.5     74.0     71.3     68.3     65.0     61.3         23
            57.1     52.6     48.7     44.3     39.6     34.5     28.8     22.8         24
           03397      170     86.0     83.9     81.8     79.7     77.6     75.4         25
            73.1     70.8     68.4     65.9     63.3     60.4     57.1     53.4         26
            49.2     44.7     40.8     36.6     32.0     26.8     21.1     14.8         27
           03397      180     80.5     78.5     76.4     74.2     72.1     69.9         28
            67.6     65.3     62.8     60.3     57.6     54.6     51.3     47.5         29
            43.2     38.7     34.8     30.7     26.1     21.2     15.7      9.9
```

APPENDIX E

CARD FORMAT FOR THE FLIGHT NOISE REFERENCE DATASETS

This Appendix contains a description of the content and format of the flight noise reference datasets required as input to the OMEGA 10 program. These datasets are stored in NOISEFILE 4 in CDC UPDATE format. They are read from file TAPE7 by the OMEGA 10 program.

CARD FORMAT FOR FLIGHT NOISE AVERAGE REFERENCE DATASETS

Card Number 1 (COMDECK card)

Column	Format	Data Description
1-8	A8	*COMDECK
9	Blank	
10	A1	"N" for normalized data
11-13	A3	Aircraft code number (eg. 031; include leading zeros)
14-15	A2	Operation power code (eg. 01; include leading zeros)
16	A1	Operation type code (eg. 1)
17	A1	Profile version code (eg. A; this code does not apply to the reference datasets; it is included to be consistent with the profile datasets.)
18	A1	Revision identifier 0 for original 1 for first revision 2 for second revision, etc.
19-80	Blank	

Card Number 2 (Comment card)

1-7	A7	"Comment"
8	Blank	
9-11	A3	Aircraft code number (eg. 031)
12-13	A2	Operation power code (eg. 01)
14	A1	Operation type code (eg. 1)
15	A1	Profile version code (eg. A)
16	A1	Revision identifier 0 for original 1 for first revision, etc.
17	Blank	
18-22	A5	"OMEGA"
23	Blank	
24-26	F3	Analysis program (eg. 6.6)
27	Blank	
28-36	A9	Date of OMEGA 6.6 run (eg. 10 JUL 75)
37	Blank	
38-44	A7	Aircraft name (eg. F-4)
45	Blank	
46-49	I4	Reference minimum slant range (from OMEGA 5)
50	Blank	
41-52	A2	"FT"

Card Number 2 (Comment card) - Continued

Column	Format	Data Description
53-54	Blank	
55-57	I3	Reference airspeed (from OMEGA 5)
58	Blank	
59-61	A3	"KTS"
62-63	Blank	
64-66	I3	Standard day temperature (59°F)
67	Blank	
68	A1	"F"
69-70	Blank	
71-73	I3	Standard day relative humidity (70%)
74	Blank	
75-77	A5	"PCT"

Card Number 3 (Comment card)

1-7	A7	"Comment"
8	Blank	
9-17		Same as card number 3
18-32	A15	Engine type (eg. Reciprocating)
33	Blank	
34-58	A25	Drag Configuration (eg. Gear Down, 20 Deg Flaps)

Card Number 4 (Comment card)

1-7	A7	"Comment
8	Blank	
9-17		Same as card number 3
18-37	A20	Power Description
38	Blank	
39-43	A5	1st engine power setting value
44	Blank	
45-50	A6	1st engine power setting units
51-52	Blank	
53-57	A5	2nd engine power setting value
58	Blank	
59-64	A6	2nd engine power setting units
65-66	Blank	
67-71	A5	3rd engine power setting value
72	Blank	
73-78	A6	3rd engine power setting units

Card Number 5 (Data card)

Column	Format	Data Description
1*	A1	"2" (formerly BBN-2 dataset)
2-3*	A2	Program version number (eg. 66)
4-6*	A3	Aircraft code
7*	A1	Operation type code
8-9*	A2	Operation power code
10-15*	A6	Date on which OMEGA 6 data were computed (eg. 171273 is 17 Dec 73)
16	I1	Card sequence number (1)
17-26	A10	Aircraft name
27-46	2A10	Operation power description
47-50	I4	Number of records for this power setting
51-55	I5	S(0)--reference minimum slant range in feet
56-60	I5	V(0)--reference airspeed in knots
61-65	I5	Mean angle THETA in degrees (nearest tenth without decimal)

Card Number 6 (Data card)**

1-15*		Same as card 1 above
16	I1	Card sequence number (2)
17-20	I4	Mean PNL in PNdB
21-24	I4	Mean PNLT in PNdB
25-28	I4	Mean AL in dBA
29-32	I4	Mean ALT in dBA
33-36	I4	Mean EPNL in EPNdB
37-40	I4	Mean SEL in dB
41-44	I4	Mean SELT in dB
45-48	I4	Mean C in dB
49-80	8I4	Mean SPL spectrum in dB re .00002 N/M^2 for frequency band numbers 17 through 24.

Card Number 7 (Data Card)**

1-15*		Same as card 1
16	I1	Card sequence number (3)
17-80	16I4	Mean SPL spectrum in dB re .00002 N/M^2 for frequency band numbers 25 through 40.

NOTE: The above data cards (cards 5, 6 and 7) can be used as normalized data input to the OMEGA 6 program.

*Columns 1 to 15 will always be numeric and can be read with an integer format.

**Data in columns 16 through 80 are punched to the nearest tenth with the decimal omitted; eg. 101.2 is punched as 1012.

APPENDIX F

CARD FORMAT FOR THE FLIGHT NOISE PROFILE DATASETS

This Appendix contains a description of the content and format of the flight noise profile datasets written on file TAPE3 by the OMEGA 10 program. This is the format required by the NOISEMAP program.

CARD FORMAT FOR FLIGHT NOISE PROFILE DATASETS

Card Number 1 (COMDECK card)

Column	Format	Data Description
1- 8	A8	*COMDECK
9	Blank	
10	A1	Identifier for type of noise descriptor E for EPNL S for SELT L for SEL
11-13	A3	Aircraft code number (eg. 031; include leading zeros)
14-15	A2	Operation power code (eg. 01; include leading zeros)
16	A1	Operation type code (eg. 1)
17	A1	Profile version code (eg. A for standard temperature and relativity humidity)
18	A1	Revision identifier 0 for original 1 for first revision 2 for second revision, etc.
19-80	Blank	

Card Number 2 (Data card)

1- 6	A6	Type of noise descriptor (eg. SEL, SELT or EPNL)
7- 8	Blank	
9-11	A3	Aircraft code number (eg. 031)
12-13	A2	Operation power code (eg. 01)
14	A1	Operation type code (eg. 1)
22	I1	Air to Ground Identifier = 2
23-30	F8	Noise level at 200 ft. (air to ground)
31-38	F8	Noise level at 250 ft. (air to ground)
39-46	F8	Noise level at 315 ft. (air to ground)
47-54	F8	Noise level at 400 ft. (air to ground)
55-62	F8	Noise level at 500 ft. (air to ground)
63-70	F8	Noise level at 630 ft. (air to ground)
71-77	A7	Aircraft name (eg. F-4)
78-79	Blank	
80	I1	Data card sequence number = 1

CARD FORMAT FOR FLIGHT NOISE PROFILE DATASETS

Card Number 3 (Comment card)

Column	Format	Data Description
1- 7	A7	"Comment"
8	Blank	
9-11	A3	Aircraft code number (eg. 031)
12-13	A2	Operation power code (eg. 01)
14	A1	Operation type code (eg. 1)
15	A1	Profile version code (eg. A)
16	A1	Revision identifier 0 for original 1 for first revision, etc.
17	Blank	
18-22	A5	"OMEGA"
23	Blank	
24-26	F3	Analysis program (eg. 6.6)
27	Blank	
28-36	A9	Date of OMEGA 6.6 run (eg. 10 JUL 75)
37	Blank	
38-44	A7	Aircraft name (eg. F-4)
45	Blank	
46-49	I4	Reference distance **
50	Blank	
51-52	A2	"FT"**
53-54	Blank	
55-57	I3	Reference speed
58	Blank	
59-61	A3	"KTS"
62-63	Blank	
64-66	I3	Temperature (°F)
67	Blank	
68	A1	"F"
69-70	Blank	
71-73	I3	Relative Humidity (%)
74	Blank	
75-77	A3	"PCT"

** Not included in profile datasets written by the OMEGA 10 program.

CARD FORMAT FOR FLIGHT NOISE PROFILE DATASETS

Card Number 4 (Comment card)

Column	Format	Data Description
1- 7	A7	"Comment"
8	Blank	
9-17		Same as card number 3
18-32	A15	Engine type (eg. Reciprocating)
33	Blank	
34-58	A25	Drag Configuration (eg. Gear Down, 20 Deg Flaps) **

Card Number 5 (Comment card)

Column	Format	Data Description
1- 7	A7	"Comment"
8	Blank	
9-17		Same as card number 3
18-37	A20	Power Description
38	Blank	
39-43	A5	1st engine power setting value
44	Blank	
45-50	A6	1st engine power setting units
51-52	Blank	
53-57	A5	2nd engine power setting value **
58	Blank	
59-64	A6	2nd engine power setting units **
65-66	Blank	
67-71	A5	3rd engine power setting value **
72	Blank	
73-78	A6	3rd engine power setting units **

Card Number 6 (Data card)

Column	Format	Data Description
1- 6	Blank	
7-14	F8	Noise level at 800 ft. (air to ground)
15-22	F8	Noise level at 1000 ft. (air to ground)
23-30	F8	Noise level at 1250 ft. (air to ground)
31-38	F8	Noise level at 1600 ft. (air to ground)
39-46	F8	Noise level at 2000 ft. (air to ground)
47-54	F8	Noise level at 2500 ft. (air to ground)
55-62	F8	Noise level at 3150 ft. (air to ground)
63-70	F8	Noise level at 4000 ft. (air to ground)
71-79		Same as card number 2
80	I1	Data card sequence number = 2

**Not included in profile datasets written by the OMEGA 10 program; see note after Card Number 10.

CARD FORMAT FOR FLIGHT NOISE PROFILE DATASETS

Card Number 7 (Data card)

Column	Format	Data Description
1- 6	Blank	
7-14	F8	Noise level at 5000 ft. (air to ground)
15-22	F8	Noise level at 6300 ft. (air to ground)
23-30	F8	Noise level at 8000 ft. (air to ground)
31-38	F8	Noise level at 10000 ft. (air to ground)
39-46	F8	Noise level at 12500 ft. (air to ground)
47-54	F8	Noise level at 16000 ft. (air to ground)
55-62	F8	Noise level at 20000 ft. (air to ground)
63-70	F8	Noise level at 25000 ft. (air to ground)
71-79		Same as card number 2
80	I1	Data card sequence number = 3

Card Number 8 (Data card)

1- 8	Blank	
9-14		Same as card number 2
22	I1	Ground to ground identifier = 1
23-30	F8	Noise level at 200 ft. (ground to ground)
31-38	F8	Noise level at 250 ft. (ground to ground)
39-46	F8	Noise level at 315 ft. (ground to ground)
47-54	F8	Noise level at 400 ft. (ground to ground)
55-62	F8	Noise level at 500 ft. (ground to ground)
63-70	F8	Noise level at 630 ft. (ground to ground)
71-79		Same as card number 2
80	I1	Data card sequence number = 4

Card Number 9 (Data card)

1- 6	Blank	
7-14	F8	Noise level at 800 ft. (ground to ground)
15-22	F8	Noise level at 1000 ft. (ground to ground)
23-30	F8	Noise level at 1250 ft. (ground to ground)
31-38	F8	Noise level at 1600 ft. (ground to ground)
39-46	F8	Noise level at 2000 ft. (ground to ground)
47-54	F8	Noise level at 2500 ft. (ground to ground)
55-62	F8	Noise level at 3150 ft. (ground to ground)
63-70	F8	Noise level at 4000 ft. (ground to ground)
71-79		Same as card number 2
80	I1	Data card sequence number = 5

CARD FORMAT FOR FLIGHT NOISE PROFILE DATASETS

Card Number 10 (Data card)

Column	Format	Data Description
1- 6	Blank	
7-14	F8	Noise level at 5000 ft. (ground to ground)
15-22	F8	Noise level at 6300 ft. (ground to ground)
23-30	F8	Noise level at 8000 ft. (ground to ground)
31-38	F8	Noise level at 10000 ft. (ground to ground)
39-46	F8	Noise level at 12500 ft. (ground to ground)
47-54	F8	Noise level at 16000 ft. (ground to ground)
55-62	F8	Noise level at 20000 ft. (ground to ground)
63-70	F8	Noise level at 25000 ft. (ground to ground)
71-79		Same as card number 2
80	Blank	

NOTE: Flight noise profile datasets are written by both the OMEGA 6 and OMEGA 10 programs. There are minor differences in the content of the datasets written by the two programs (see footnotes on pages F-3 and F-4). In addition to the differences (deletions) noted on the previous pages, the OMEGA 10 version of the profile datasets also contains the following data:

(1) On card number 4 (second comment card):

(a) Columns 35 to 43 contain the name of the reference file dataset used as a reference in the Δ"6 interpolation or extrapolation.

(b) Columns 45 to 53 and 55 to 63 contain the names of the reference file datasets used to determine the Δ"6 slope line. If a second slope line is required, the additional reference file dataset name is in columns 65 to 73.

(2) A fourth comment card is added after card number 5 when the extrapolation limit was exceeded. This card contains the usual ID information plus the following:

"Power Setting Extrapolation Limited by AMRL/BBE, WPAFB."

APPENDIX G

CARD FORMAT FOR THE GROUND RUNUP NOISE REFERENCE DATASETS

This Appendix contains a description of the content and format of the ground runup noise reference datasets required as input to the OMEGA 11 program. These datasets are stored in NOISEFILE 4 in CDC UPDATE format. They are read from file TAPE7 by the OMEGA 11 program.

CARD FORMAT FOR GROUND RUNUP NOISE REFERENCE DATASETS

This reference dataset contains sound pressure level data normalized to 250 feet and standard day conditions. The data cards (cards 5 to 42) can be used as OMEGA 8 input to the OMEGA 8 program.

Card Number 1 (COMDECK card)

Column	Format	Data Description
1-8	A8	*COMDECK
9	Blank	
10	A1	"N" for normalized data
11-13	A3	Noise source code (eg. 061; include leading zero)
14-15	A2	Operation code (eg. 30; include leading zero)
16	A1	Profile version code (eg. A; this code does not apply to the reference datasets; it is included to be consistent with the profile datasets)
17	A1	Revision identifier 0 for original 1 for first revision 2 for second revision, etc.
18-80	Blank	

Card Number 2 (Comment card)

1-7	A7	"Comment"
8	Blank	
9-11	A3	Noise source code (eg. 061)
12-13	A2	Operation power code (eg. 30)
14	A1	Profile version code (eg. A)
15	A1	Revision identifier 0 for original 1 for first revision 2 for second revision, etc.
16	Blank	
17-21	A5	"OMEGA"
22	Blank	
23-25	F3	Analysis program (eg. 8.2)
26	Blank	
27-35	A9	Date of OMEGA 8.2 run (eg. 10 JUL 75)
36	Blank	
37-39	I3	Standard day temperature (59°F)
40	Blank	
41	A1	"F"
42	Blank	
43-45	I3	Standard day relative humidity (70%)
46	Blank	
47-49	A3	"PCT"

Card Number 2 (Comment card) - Continued

Column	Format	Data Description
50-51	Blank	
52-56	F5.2	Standard day barometric pressure (29.92 in Hg)
57	Blank	
58-62	A5	"IN HG"
63-65	Blank	
66-75	A10	Test number (eg. 74-004-010)
76	Blank	
77-78	A2	Run number (eg. 02)

Card Number 3 (Comment card)

1-7	A7	"Comment"
8-16		Same as comment card number 1
17-41	A25	Noise source description, part 1 (eg. aircraft name)
42	Blank	
43-67	A25	Noise source description, part 2 (eg. propulsion system type)

Card Number 4 (Comment card)

1-7	A7	"Comment"
8-16		Same as comment card number 1
17	Blank	
18-37	A20	Power Description
38-39	Blank	
40-44	A5	1st source power setting value
45	Blank	
46-51	A6	1st source power setting units
52-53	Blank	
54-58	A5	2nd source power setting value
59	Blank	
60-65	A6	2nd source power setting units
66-67	Blank	
68-72	A5	3rd source power setting value
73	Blank	
74-79	A6	3rd source power setting units

Card Number 5 (Data card)*

Column	Format	Data Description	
1-2	I2	Dataset number: 08	
3-10	I8	Test number (eg. 74-001-002 is 74001002).	
11-12	I2	Run number (eg. 01)	
15	I1	Card sequence number within each angle (1)	
16-20	I5	Angle in degrees (0 to 180)	
21-24	I4	Band 17	Bands 17 to 31 of the SPL spectrum normalized to reference conditions in dB re .00002 N/M^2.**
25-28	I4	Band 18	
29-32	I4	Band 19	
33-36	I4	Band 20	
37-40	I4	Band 21	
41-44	I4	Band 22	
45-48	I4	Band 23	
49-52	I4	Band 24	
53-56	I4	Band 25	
57-60	I4	Band 26	
61-64	I4	Band 27	
65-68	I4	Band 28	
69-72	I4	Band 29	
73-76	I4	Band 30	
77-80	I4	Band 31	

Card Number 6 (Data card)*

1-12		Same as card number 5 above	
15	I1	Card sequence number within each angle (2)	
16-20	I5	Angle in degrees (0 to 180)	
21-24	I4	Band 32	Bands 32 to 40 of the SPL spectrum normalized to reference conditions in dB re .00002 N/M^2.**
25-28	I4	Band 33	
29-32	I4	Band 34	
33-36	I4	Band 35	
37-40	I4	Band 36	
41-44	I4	Band 37	
45-48	I4	Band 38	
49-52	I4	Band 39	
53-56	I4	Band 40	

*These two cards are repeated for each SPL spectrum. Each dataset will contain a 19 spectra (38 data cards) for a total of 42 cards.

**Data are punched to the nearest tenth with the decimal omitted; e.g., 101.2 is punched as 1012. Data could be read using a F4.1 format.

APPENDIX H

CARD FORMAT FOR THE GROUND RUNUP NOISE PROFILE DATASETS

This Appendix contains a description of the content and format of the ground runup noise profile datasets written on file TAPE2 by the OMEGA 11 program. This is the format required by the NOISEMAP program.

CARD FORMAT FOR GROUND RUNUP NOISE PROFILE DATASETS

COMDECK Card

Column	Format	Data Description
1- 8	A8	*COMDECK
9	Blank	
10	A1	Identifier for type of noise A for AL T for ALT P for PNLT
11-13	A3	Noise source code (eg. 061; include leading zero)
14-15	A2	Operation code (eg. 30; include leading zero)
16	A1	Profile version code (eg. A for standard temperature and relative humidity)
17	A1	Revision identifier 0 for original 1 for first revision 2 for second revision, etc.
18-80	Blank	

Data Card Number 1 (Angle = 0°)

1- 6	A6	Type of noise descriptor (eg. AL, ALT or PNLT)
7- 9	Blank	
10-12	A3	Noise source code (eg. 061)
13-14	A2	Operation code (eg. 30)
15-19	Blank	
20-22	I3	Angle (= 0)
23-30	F8	Noise value for 200 ft.
31-38	F8	Noise value for 250 ft.
39-46	F8	Noise value for 315 ft.
47-54	F8	Noise value for 400 ft.
55-62	F8	Noise value for 500 ft.
63-70	F8	Noise value for 630 ft.
71-78	Blank	
79-80	I2	Data card sequence number = 1

CARD FORMAT FOR GROUND RUNUP NOISE PROFILE DATASETS

Comment Card Number 1

Column	Format	Data Description
1- 7	A7	"Comment"
8	Blank	
9-11	A3	Noise source code (eg. 061)
12-13	A2	Operation power code (eg. 30)
14	A1	Profile version code (eg. A)
15	A1	Revision identifier 0 for original 1 for first revision 2 for second revision, etc.
16	Blank	
17-21	A5	"OMEGA"
22	Blank	
23-25	F3	Analysis program (eg. 8.2)
26	Blank	
27-35	A9	Date of OMEGA 8.2 run (eg. 10 JUL 75)
36	Blank	
37-39	I3	Temperature (°F)
40	Blank	
41	A1	"F"
42	Blank	
43-45	I3	Relative Humidity (%)
46	Blank	
47-49	A3	"PCT"
50-51	Blank	
52-56	F5.2	Barometric pressure (in Hg)
57	Blank	
58-62	A5	"IN HG"
63-65	Blank	
66-75	A10	Test number (eg. 74-004-010)
76	Blank	
77-78	A2	Run number (eg. 02)

Comment Card Number 2

Column	Format	Data Description
1- 7	A7	"Comment"
8-16		Same as comment card number 1
17-41	A25	Noise source description, part 1 (eg. aircraft name)
42	Blank	
43-67	A25	Noise source description, part 2 (eg. propulsion system type)
68-80	A13	Name of reference datasets used to interpolate this profile data (OMEGA 11 only).

CARD FORMAT FOR GROUND RUNUP NOISE PROFILE DATASETS

Comment Card Number 3

Column	Format	Data Description
1- 7	A7	"Comment"
8-16		Same as comment card number 1
17	Blank	
18-37	A20	Power Description
38-39	Blank	
40-44	A5	1st source power setting value
45	Blank	
46-51	A6	1st source power setting units
52-53	Blank	
54-58	A5	2nd source power setting value
59	Blank	
60-65	A6	2nd source power setting units
66-67	Blank	
68-72	A5	3rd source power setting value
73	Blank	
74-79	A6	3rd source power setting units

Data Card Number 2 (Angle = 0°)

1- 6	Blank	
7-14	F8	Noise value at 800 ft.
15-22	F8	Noise value at 1000 ft.
23-30	F8	Noise value at 1250 ft.
31-38	F8	Noise value at 1600 ft.
39-46	F8	Noise value at 2000 ft.
47-54	F8	Noise value at 2500 ft.
55-62	F8	Noise value at 3150 ft.
63-70	F8	Noise value at 4000 ft.
71-78	Blank	
79-80	I2	Data card sequence number = 2

Data Card Number 3 (Angle = 0°)

1- 6	Blank	
7-14	F8	Noise value at 5000 ft.
15-22	F8	Noise value at 6300 ft.
23-30	F8	Noise value at 8000 ft.
31-38	F8	Noise value at 10000 ft.
39-46	F8	Noise value at 12500 ft.
47-54	F8	Noise value at 16000 ft.
55-62	F8	Noise value at 20000 ft.
63-70	F8	Noise value at 25000 ft.
71-78	Blank	
79-80	I2	Data card sequence number = 3

CARD FORMAT FOR GROUND RUNUP NOISE PROFILE DATASETS

Data Card Number 1 (For a maximum of 8 angles between 10° and 170°)

Column	Format	Data Description
1- 6	Blank	
7-14		Same as data card number 1 (angle =0°)
15-22	I8	Angle in degrees
23-78		Same as data card number 1 (angle = 0°)
79-80	I2	Data card sequence number

Data Card Number 2 (For a maximum of 8 angles between 10° and 170°)

1- 6	Blank	
7-78		Same as data card number 2 (angle = 0°)
79-80	I2	Data card sequence number

Data Card Number 3 (For a maximum of 8 angles between 10° and 170°)

1- 6	Blank	
7-78		Same as data card number 3 (angle = 0°)
79-80	I2	Data card sequence number

Data Card Number 1 (Angle = 180°)

1- 6	Blank	
7-14		Same as data card number 1 (angle = 0°)
15-22	I8	Angle in degrees (= 180°)
23-78		Same as data card number 1 (angle = 0°)
79-80	I2	Data card sequence number

Data Card Number 2 (Angle = 180°)

1- 6	Blank	
7-78		Same as data card number 2 (angle = 0°)
79-80	I2	Data card sequence number

Data Card Number 3 (Angle = 180°)

1- 6	Blank	
7-78		Same as data card number 3 (angle = 0°)
79-80	Blank	

APPENDIX I
OMEGA 10 PROGRAM LISTING

The listing for the OMEGA 10 program is provided in the following pages. Included at the end of the program listing is a Super Index which lists all variable names defined in this program as well as all routines in which they are used.

```
      PROGRAM OMEGA10(INPUT,OUTPUT,TAPE5=INPUT,TAPE6=OUTPUT,TAPE7,TAPE3)
C  DECK MAIN    OMEGA10
C***********************************************************************
C***********************************************************************
C
C  THIS OMEGA 10 SUMMARY PROGRAM WAS WRITTEN BY THE UNIVERSITY OF DAYTON
C  RESEARCH INSTITUTE UNDER CONTRACT F33615-75-C-5040 WITH THE 6570
C  AEROSPACE MEDICAL RESEARCH LABORATORY (AMRL/BBE) AT WRIGHT-PATTERSON
C  AIR FORCE BASE, OHIO 45433.
C
C***********************************************************************
C***********************************************************************
C
C            OMEGA 10 PROGRAM  VERSION 3    (25 SEPT 1981)
C
C***********************************************************************
C
C       THE FOLLOWING SUBROUTINES ARE USED BY THIS PROGRAM:
C
C       DK1----ALPH                   DK09---FNOY
C       DK2----ATKN                   DK10---CPTC
C       DK3----ICV                    DK11---CAL
C       DK4----HEAD                   DK12---OUTH
C       DK5----IPA                    DK13---OUTJ
C       DK6----OUTG                   DK14---PPFDAT
C       DK7----CDIST                  DK15---TITPG
C       DK8----CPNL                   DK16---SETUP06
C                                     DK17---DELTA6
C                                     DK18---SUMRY
C
C-----------------------------------------------------------------------
C
C  IF THIS PROGRAM IS USED AS A PRE-PROCESSOR WITHOUT PRINTOUT (EXCEPT
C  ERROR MESSAGES) ON THE 'OUTPUT' FILE (TAPE6), THE /OUTC/ LABELED
C  COMMON AND THE IORD(28) DATA STATEMENT MAY BE REMOVED FROM THE MAIN
C  DECK AND THE FOLLOWING SUBROUTINES MAY BE REMOVED FROM THE PROGRAM:
C  HEAD, IPA, OUTG, OUTH, OUTJ, TITPG, AND SUMRY.  ALL EXCEPT 'HEAD'
C  ARE CALLED FROM THE 'MAIN' ROUTINE;  'HEAD' IS CALLED FROM
C  SUBROUTINE 'OUTH'.
C
C***********************************************************************
C***********************************************************************
C
C   THE FOLLOWING ARRAYS ARE USED IN THIS PROGRAM:
C
C   ATNR --- ATMOSPHERIC ABSORPTION COEFFICIENTS FOR STANDARD
C            TEMPERATURE (59 F) AND HUMIDITY (70 %).
C   ATNC --- ATMOSPHERIC ABSORPTION COEFFICIENTS FOR PROFILE
C            OUTPUT TEMPERATURE AND HUMIDITY (ITEMP AND IRHUM).
C   SX   --- DISTANCE DATA FOR 22 DISCRETE DISTANCES IN FEET.
C   OPC  --- OPERATION POWER CODE FOR EACH INPUT  POWER SETTING (REF).
C   OPCC --- OPERATION POWER CODE FOR EACH OUTPUT POWER SETTING.
C   OPCD --- DEFAULT OPERATION POWER CODES.
C   OPCR --- OPERATION POWER CODE FOR THE REFERENCE DATA FROM WHICH THE
C            OPCC DATA ARE COMPUTED AND THE OPERATION DESCRIPTION TAKEN.
```

```
C     VX    --- AIRCRAFT VELOCITY FOR EACH OUTPUT POWER SETTING (KNOTS).
C     IV    --- REFERENCE AIRCRAFT VELOCITY FOR EACH POWER SETTING (KNOTS)
C     IMS   --- REFERENCE MINIMUM SLANT RANGE FOR EACH POWER SETTING (FEET)
C     DRAG  --- DRAG CONFIGURATION
C     ET    --- ENGINE TYPE
C     PS    --- INPUT POWER SETTING FOR EACH OPC FROM THE REFERENCE FILE.
C     PSIF  --- INPUT POWER SETTING FOR EACH OPC (ARRAY--FLOATING POINT).
C     PSC   --- OUTPUT POWER SETTING FOR EACH OPCC.
C     PSCF  --- OUTPUT POWER SETTING FOR EACH OPCC (ARRAY--FLOATING POINT).
C     P     --- POWER SETTING DESCRIPTION FOR INPUT DATA.
C     PC    --- POWER SETTING DESCRIPTION FOR OUTPUT DATA.
C     NR    --- NUMBER OF RUNS (MEASURE LOCATIONS) USED TO COMPUTE THE
C               MEAN REFERENCE DATA IN THE OMEGA 6 PROGRAM.
C     SR    --- NORMALIZED REFERENCE DATA FOR EACH POWER SETTING (SEE
C               SUBROUTINE 'COIST').
C     PP    --- PLOT ARRAY DEFINED IN SUBROUTINE 'IPA' AND USED IN
C               SUBROUTINES 'OUTG' AND 'OUTJ'.
C     ISC   --- ISC IS DEFINED AND USED IN SUBROUTINES 'OUTG' AND 'OUTJ'.
C     ORD   --- DEFINES ORDINATE ID FOR  TAB PLOTS--- DEFINED IN SUBROUTINE
C               'IPA' AND USED IN SUBROUTINE 'OUTJ'.
C     ISRC  --- INTEGER FORM OF THE MEAN SPL USED TO PLOT SPL DATA IN
C               SUBROUTINE 'OUTG'.
C     SPLX  --- SPL SPECTRA FOR THE PROFILE DISTANCES.
C     EPNLX--- EPNL FOR PROFILE DISTANCES AT OUTPUT P.S. AND AIR SPEED.
C     SELTX--- SELT FOR PROFILE DISTANCES AT OUTPUT P.S. AND AIR SPEED.
C     SELX  --- SEL FOR PROFILE DISTANCES AT OUTPUT P.S. AND AIR SPEED.
C     PNLTX--- PNLT FOR PROFILE DISTANCES AT OUTPUT P.S. AND AIRSPEED.
C     PNLX  --- PNL  FOR PROFILE DISTANCES AT OUTPUT P.S. AND AIRSPEED.
C     ALTX  --- ALT  FOR PROFILE DISTANCES AT OUTPUT P.S. AND AIRSPEED.
C     ALX   --- AL   FOR PROFILE DISTANCES AT OUTPUT P.S. AND AIRSPEED.
C     PRDA  --- AIR-TO-GROUND EPNL, SELT ---> AL PROFILE DATA
C               COMPUTED FROM REFERENCE DATA AND ADJUSTED TO THE PROGRAM
C               REFERENCE AIRSPEED (RV).
C     PRDG  --- GROUND-TO-GROUND EPNL, SELT ---> AL PROFILE DATA
C               COMPUTED FROM REFERENCE DATA AND ADJUSTED TO THE PROGRAM
C               REFERENCE AIRSPEED (RV).
C     PRDC  --- EPNL, SELT ---> AL DATA FOR AIR-TO-GROUND AND GROUND-TO-
C               GROUND FOR ONE OUTPUT POWER SETTING --- COMPUTED BY
C               SUBROUTINE 'DELTA6'.
C     OPP   --- OPERATION POWER CODE ARRAY DEFINED IN SUB.'SETUPD6'.
C     MEAS  --- COMPUTE OUTPUT EPNL, SELT, AND SEL MEASURE DATA FOR MEAS>0:
C               WHERE MEAS(1) --- EPNL
C                     MEAS(2) --- SELT
C                     MEAS(3) --- SEL
C     COMD  --- PART OF THE 'COMDECK' NAME USED IN THE SUMMARY PAGE
C               OUTPUT; CONTAINS INPUT OPC, OTC, PV, AND CRI.
C     LFLG  --- EXTRAPOLATION LIMIT FLAG (SEE SUBROUTINE 'DELTA6').
C               LFLG=1 -- LIMIT WAS EXCEEDED FOR THIS POWER SETTING.
C               LFLG=0 -- DATA ARE 'OK' FOR THIS POWER SETTING.
C               LFLG=-1 -- ALL DATA ARE OMITTED FOR THIS POWER SETTING.
C     IREF  --- SEE SUBROUTINE 'DELTA6'.
C
C**********************************************************************
C
C     THE FOLLOWING ARE A PARTIAL LIST OF THE NON-DIMENSIONED VARIABLES
```

```
C     USED IN THIS PROGRAM:
C     IBNL --- LOWEST FREQUENCY BAND NUMBER INDEX---IBNL=1 CORRESPONDS TO
C              BAND NUMBER 17 (IBNL MUST BE 1 IN THIS PROGRAM).
C     IBNH --- HIGHEST FREQUENCY BAND NUMBER INDEX--IBNH=41 CORRESPONDS TO
C              BAND NUMBER 40 (IBNH MUST BE 24 IN THIS PROGRAM).
C     IVER --- PROGRAM VERSION NUMBER (ONE DIGIT INTEGER)
C     IPROP--- PROPAGATION PRAMETER; 1--AIR TO GROUND; 2--GROUND TO GROUND
C     DATE --- CURRENT DATE IN THE FORM: 15 DEC 73
C     DATEN--- CURRENT DATE IN THE FORM: 151273
C     OTC  --- OPERATION TYPE CODE
C     ITEMP--- OUTPUT (PROFILE DATA) SURFACE TEMPERATURE (F)
C     IRHUM--- OUTPUT (PROFILE DATA) RELATIVE HUMIDITY (PERCENT)
C     ACC  --- AIRCRAFT CODE READ FROM SETUP CARD
C     MM   --- MAXIMUM NUMBER OF INPUT  POWER SETTINGS PER AIRCRAFT  (6)
C     NPM  --- MAXIMUM NUMBER OF OUTPUT POWER SETTINGS PER AIRCRAFT  (12)
C     N    --- NUMBER OF INPUT POWER SETTINGS READ FROM THE REFERENCE FILE
C     NP   --- NUMBER OF OUTPUT POWER SETTINGS FOR WHICH PROFILE DATA ARE
C              REQUESTED FOR THIS AIRCRAFT.
C     RV   --- PROGRAM REFERENCE AIRSPEED (250.0 KNOTS).
C     MOPC --- NUMBER OF OPERATION POWER CODES IN ARRAY OPP(SUB.'SETUPD6')
C     OOPC --- OPERATION POWER CODE READ FROM REFERENCE DATASET CARD.
C     AC   --- AIRCRAFT NAME READ FROM NORMALIZED DATASET CARD.
C     IORD --- DISTANCE OR FREQUENCY DATA USED BY SUBROUTINES 'OUTG',
C              'OUTH' AND 'OUTJ' FOR PRINTOUT ONLY.
C     PV   --- PROFILE VERSION CODE
C     CRI  --- COMDECK REVISION IDENTIFIER
C     IPTC --- BAND NUMBER  FROM WHICH TONE CORRECTION WAS COMPUTED
C              FOR REFERENCE DISTANCE SPECTRUM (PROFILE DATA).
C     IPR  --- PROGRAM CODE SHEET PRINT CONTROL FLAG.
C              IPR=0 --- NO PRINTOUT ON OUTPUT FILE (TAPE6).
C              IPR=1 --- TAB DATA PRINTED ON THE OUTPUT FILE.
C     IPRR --- SPECIAL PRINT FLAG WHICH IS SET EQUAL TO 2 FOR NP=0.
C              FOR NP>0, IPRR=IPR.
C     IPU  --- FLAG WHICH CONTROLS THE PROFILE DATASET OUTPUT ON FILE
C              'TAPE3'; DATA PRINTED FOR IPU=1.  FOR 'IPR'=0, DEFAULT
C              IPU=1.    FOR 'IPR'=1, DEFAULT IPU=0.
C     DELN --- INCREMENTAL CHANGE IN NOISE POWER OUTPUT RELATIVE TO THE
C              NOISE POWER AT REFERENCE CONDITIONS
C     LIM  --- EXTRAPOLATION CHECK FLAG; WHEN LIM=1, 'EXTMX' DB LIMIT IS
C              CHECKED.  CHECKED ONLY FOR FIRST AIR-TO-GROUND CALL TO
C              SUBROUTINE 'DELTAS' FOR EACH POWER SETTING.
C     EXTMX -- MAXIMUM PERMITTED EXTRAPOLATION OF THE MEASURE DATA
C              (EPNL ETC.) FROM THE REFERENCE (OPCR) MEASURE DATA AT
C              THE REFERENCE DISTANCE (1000 FEET).
C     ITP,IAP,IMP -- SEE SUBROUTINE 'SETUPD6'.
C
C***********************************************************************
C
C     THE FOLLOWING INPUT DECK IS READ BY THIS PROGRAM:
C
C       READ(5,1001) DATE,DATEN,IPR,MEAS,IPU <-- (NOTE: ONLY ONE PER JOB)
C     READ THE FOLLOWING CARDS FOR EACH AIRCRAFT 'ACC' (AN END OF
C     FILE TERMINATES THE JOB):
C       READ(5,1000)    ACC,ITEMP,IRHUM,PV,CRI,DELN,NP,PSU
C     THE FOLLOWING READ STATMENT READS ONE OR TWO CARDS DEPENDING ON
```

```
C    THE VALUE OF 'NP'. ONE CARD FOR NP<7; TWO FOR NP=7 TO 12.
C    THE ENTIRE READ STATEMENT IS OMITTED WHEN 'NP'=0.
C      READ(5,1010) (PSC(L),VX(L),OPCR(L),OPCC(L),L=1,NP)
C
C    ALL REFERENCE DATASETS FOR AIRCRAFT 'ACC' ARE READ FROM FILE
C    'TAPE7'.
C
C-----------------------------------------------------------------------
C
C    FORMATS OF CODE SHEET INPUT DATA:
C1000 FORMAT(A3,2I3,2(1X,A1),F6.0,I2,A6)
C1001 FORMAT(A10,A6,5I2)
C1010 FORMAT(6(A5,F3.0,2A2))
C
C***********************************************************************
C
C    THE PROFILE DATASETS ARE WRITTEN ON FILE 'TAPE3' WHICH COULD BE
C    COPIED TO THE 'PUNCH'.FILE---SEE SUB. 'PPFDAT'.
C
C***********************************************************************
C
C    THE FOLLOWING ARE CHECKED FOR EACH AIRCRAFT RUN AND ERROR OR
C    WARNING MESSAGES ARE PRINTED:
C
C     I) SKIP AIRCRAFT DATA WHEN THE FOLLOWING OCCUR:
C        1) POWER SETTING UNITS ON CODE SHEET AND IN REFERENCE FILE
C           DON'T MATCH.
C        2) REFERENCE FILE DATA CARD ERROR IN OPERATION POWER CODE,
C           AIRCRAFT CODE, OR CARD SEQUENCE NUMBER.
C        3) REFERENCE FILE MINIMUN SLANT RANGE IS NOT WITHIN 1% OF A
C           STANDARD PROFILE DISTANCE.
C        4) NO POWER SETTING DATA FOUND ON THE REFERENCE FILE FOR THIS
C           AIRCRAFT.
C
C    II) PRINT WARNING MESSAGES WHEN THE FOLLOWING OCCUR:
C        1) REFERENCE FILE CONTAINS MORE THAN 'MM' DATASETS; ONLY THE
C           FIRST 'MM' ARE READ FOR THIS AIRCRAFT (MM=6 INITIALLY).
C        2) REFERENCE FILE MINIMUM SLANT RANGE NOT EQUAL TO 1000 FEET
C           AS ASSUMED BY THE PROGRAM IN SUBROUTINES 'DELTA6' AND
C           'PPFDAT'.
C        3) THE REQUESTED POWER SETTING FOR 'NORMAL RATED THRUST'
C           (OPC=12) IS NOT BETWEEN 'APPROACH' AND 'TAKEOFF' (OR
C           'MAX RATED THRUST' OR 'INTERMEDIATE POWER (MIL)') AS
C           REQUIRED FOR THIS POWER SETTING.
C
C   III) REQUESTED OPERATION POWER CODES (OPCC) ARE OMITTED WHEN THE
C        FOLLOWING OCCUR (ERROR MESSAGE PRINTED IN SUB. 'SETUP06'):
C        1) THERE IS INSUFFICIENT DATA FOR EXTRAPOLATION OR
C           INTERPOLATION TO REQUESTED POWER SETTING (PSC).
C        2) REFERENCE FILE AND REQUESTED POWER SETTINGS (PS AND PSC) ARE
C           NOT EQUAL AS REQUIRED FOR THIS OPERATION POWER CODE (OPCR).
C        3) REFERENCE FILE AND REQUESTED AIRSPEED (IV AND VX) ARE NOT
C           EQUAL AS REQUIRED FOR THIS OPERATION POWER CODE (OPCR).
C        4) REQUESTED REFERENCE OPERATION POWER CODE (OPCR) WAS NOT
C           FOUND IN THE REFERENCE FILE (TAPE7).
```

```
C
C*******************************************************************
C
C   NOTE: IF NEW OPERATION POWER CODES ARE ADDED TO THE REFERENCE
C         FILE, VARIABLE 'MOPC' AND DATA STATEMENT ARRAY 'OPP(20)'
C         MUST BE UPDATED AND THE RULES GOVERNING THE NEW OPC'S MUST
C         BE APPLIED, ALL IN SUBROUTINE 'SETUPD6'.
C
C*******************************************************************
C
C   VERSION 1 ---> VERSION 2 CHANGES (29 NOV 1979):
C   THE ONLY DECKS CHANGED WERE 'MAIN' AND 'CDIST'.
C   'MAIN' DECK: IVER WAS CHANGED FROM 1 TO 2;
C   'CDIST' DECK: D2X(I) WAS CHANGED FROM 0.5*D1 TO 0.3*D1.
C   THIS CHANGES THE DISTANCE RATIO PART OF THE DURATION CORRECTION
C   FROM 10*LOG(RATIO) TO 6*LOG(RATIO).
C
C   VERSION 2 ---> VERSION 3: ADD PNLTX, PNLX, ALTX AND ALX SINGLE EVENT
C   DATA TO PAGES 'I' AND 'M' FOR INTERPOLATED AND/OR EXTRAPOLATED DATA.
C   ALSO ADD THE TAB PLOT FOR THESE DATA ON PAGES 'J' AND 'N'.
C   DECKS CHANGED: MAIN,CDIST,CPTC,OUTH,OUTJ,PPFDAT---25 SEPT 81.
C*******************************************************************
C*******************************************************************
      DIMENSION IREQ(6),DRAG(3,6),SOURCE(2,6),OPCD(12),SENX(22,7)
     1,COMD(6),LFLG(12),IREF(12),PSDM(6),JDM(7)
      COMMON IBNL,IBNH,L,SR(6,33),NR(6),ISRC(24),SPLX(22,24),
     1 PNLTX(22),PNLX(22),ALTX(22),ALX(22),EPNLX(22),SELTX(22),SELX(22)
     2 ,PRDA(22,6,7),PRDG(22,6,7),PRLC(22,7,2)
      COMMON /COMPC/IV(6),IMS(5),P(2,6),OPC(6),OPCC(12),PS(2,6),PSC(12),
     1 PSU,PSIF(6),PSCF(12),IREQC(3,12),VX(12),SX(22),ATNC(24),ATNR(24),
     2 DELN,IPTC,IPROP,MEAS(3),OPCK(12),PC(2,12)
      COMMON /HEADC/ AC,DATE,ACC,IPAGE,IVX,ITEMP,IRHUM,IVER,PV,CRI,
     1 ET(2),OTC
      COMMON /OUTC/ORD(43),ISC(9),IORD(28),DASH,DOT,X,BLK,DATEN,PP(84,3)
      EQUIVALENCE (PNLTX(1),SENX(1,1))
      DATA IORD/50,63,80,100,125,160,200,250,315,400,500,630,800,1000,
     1 1250,1600,2000,2500,3150,4000,5000,6300,8000,10000,12500,16000,
     2 20000,25000/
      DATA BLK/1H /,         DOT/1H./,X/1HX/,DASH/1H-/,W/1HW/,ZERO/1H0/
      DATA  ATNR/0.07,0.09,0.11,0.14,0.18,0.23,0.29,0.36,0.45,0.58,0.73,
     1  0.92,1.17,1.47,1.85,2.39,3.05,4.02,5.44,7.63,9.01,12.75,18.54,
     2  27.15/,ICOM/1/,ASK/1H*/,RV/250.0/,IVER/3/,
     3          MM/6/,NPM/12/,IPAGE/0/,EXTMX/5.0/,
     4 OPCD/2H81,2H82,2H83,2H84,2H85,2H86,2H87,2H88,2H89,2H90,2H91,2H92/
      DATA JDM/3,2,1,4,5,6,7/
      IBNL=1
      IBNH=24
      ACC=BLK
C   IF MM OR NPM ARE INCREASED THE CORRESPONDING ARRAYS MUST BE CHANGED.
C   WHEN OPC'S ARE ADDED TO DATA ARRAY 'OPP', MOPC MUST BE CHANGED AND
C   THE DIMENSION OF  ARRAY 'OPP' MUST BE CHANGED IN ALL SUBROUTINES.
C
C   COMPUTE THE 22 DISCRETE DISTANCES USED IN SUBROUTINE 'CDIST'.
      DO 1 I=1,22
      FN=FLOAT(I+22)*0.1
```

```
    1 SX(I)=10.0**FN
C  READ CODE SHEET INPUT CARDS:
C  IF 'IPR' >0, DATA ARE PRINTED ON FILE 'TAPE6' (OR OUTPUT FILE).
      READ(5,1001) DATE,DATEN,IPR,MEAS,IPU
C  SET IPR, IPU AND MEAS DEFAULT VALUES:
      IF (IPR) 2,2,5
    2 IPR=0
      IPU=1
C  FOR 'IPR'=0, ONLY ONE  MEASURE IS PERMITTED:
      IF (MEAS(1)+MEAS(2)+MEAS(3)-1) 4,10,4
    4 MEAS(3)=1
      MEAS(1)=0
      MEAS(2)=0
      GO TO 10
    5 MEAS(1)=1
      MEAS(2)=1
      MEAS(3)=1
      IPR=1
      IF (IPU .LT. 1) IPU=0
   10 DACC=ACC
      IF (IPR .GT.1) IPR=1
      IPRR=IPR
      READ(5,1000)    ACC,ITEMP,IRHUM,PV,CRI,DELN,NP,PSU
C  JOB IS TERMINATED IF  AN      END OF FILE IS READ ON UNIT 5.
      IF (EOF(5)) 999,15
   15 IF (NP .GT. 0) GO TO 17
C     IF (IPR) 970,970,16
C  SET 'NP=0' DEFAULT VALUES (ADDITIONAL VALUES SET IN SUB. 'SETUP06'):
   16 IPRR=2
      GO TO 19
   17 IF (NP .GT. NPM) NP=NPM
      READ(5,1010) (PSO(L),VX(L),OPCR(L),OPCC(L),L=1,NP)
      DO 18 L=1,NP
      IF (OPCC(L) .EQ. BLK) OPCC(L)=OPCD(L)
   18 CONTINUE
C  SET DEFAULT VALUES:
   19 IF (PV .EQ. BLK) PV=W
      IF (CRI .EQ.BLK) CRI=ZERO
      IF (ABS(DELN) .LT. 0.000001) DELN=0.0
      IF (ITEMP .LT. 1) GO TO 20
C  SUBROUTINE 'ALPH' COMPUTES THE ATMOSPHERIC ABSORPTION COEFFICIENTS
C  (ATNC) FOR THE PROFILE DISTANCE DATA IF ITEMP AND IRHUM ARE NOT
C  STANDARD (59 F AND 70 %).
      CALL ALPH(FLOAT(IRHUM),FLOAT(ITEMP),ATNC,IBNL,IBNH)
      GO TO 30
   20 ITEMP=59
      IRHUM=70
      DO 25 J=IBNL,IBNH
   25 ATNC(J)= ATNR(J)
C  IF ACC=DACC, REFERENCE DATA ARE ALREADY READ FOR THIS AIRCRAFT:
   30 IF (ACC .EQ. DACC) GO TO 155
C  READ ALL REFERENCE DATA FOR AIRCRAFT 'ACC' FROM THE REFERENCE FILE
C  (TAPE7)--HERE TO LABEL 150:
      REWIND 7
      L=0
```

```
C   'ICOM' IS DEFINED AS FOLLOWS AFTER THE FIRST DATASET IS READ FROM
C   FILE 'TAPE7' (INITIALLY 'ICOM'=1):
C   ICOM=1 --- 'COMDECK' CARD IS PART OF THE NORMALIZED DATASET.
C   ICOM=0 --- 'COMDECK' CARD IS NOT PART OF THE NORMALIZED DATASET.
    50 IF (ICOM) 70,70,55
C   READ 'COMDECK' OR FIRST 'COMMENT' CARD (CD CHECKS CARD TYPE):
    55 READ(7,1205) CD,DACC,DOPC,DS1,DS2
       IF (EOF(7)) 100,60
    60 IF (CD .EQ. ASK) GO TO 70
       ICOM=0
       GO TO 75
C   READ 'COMDECK' CARD:
    65 READ(7,1205) CD
       IF (EOF(7)) 100,70
C   READ FIRST 'COMMENT' CARD:
    70 READ(7,1205) CD,DACC,DOPC,DS1,DS2
       IF (EOF(7)) 100,75
    75 IF (DACC .EQ. ACC) GO TO 90
       IF (L) 80,80,150
C   READ THROUGH THE NORMALIZED DATA DECK (5 CARDS).
    80 DO 85 I=1,5
    85 READ(7,1200) DACC
       IF (ICOM) 70,70,65
    90 L=L+1
       IF (L .GT. MM) GO TO 130
       OPC(L)=DOPC
       SOURCE(1,L)=DS1
       SOURCE(2,L)=DS2
C   READ SECOND 'COMMENT' CARD:
       READ(7,1200)     DACC,DOPC,OTC,ET,(DRAG(I,L),I=1,3)
C   READ THIRD 'COMMENT' CARD:
       READ(7,1210) DACC,COMD(L),PSDM
       IF (NP .LT. 1 .AND. PSU .EQ. BLK) GO TO 95
C   SELECT THE POWER SETTING WHICH MATCHES THE PSU UNITS:
       DO 92 I=2,6,2
       IF (PSU .EQ. PSDM(I)) GO TO 96
    92 CONTINUE
       GO TO 960
    95 I=2
    96 PS(1,L)=PSDM(I-1)
       PS(2,L)=PSDM(I)
C   READ AND CHECK THE 3 DATA CARDS:
       READ(7,1100) DACC,OTC,DOPC,IC,AC,P(1,L),P(2,L),NR(L),IMS(L),IV(L),
      1 SR(L,25)
       IF (DACC .NE. ACC .OR. DOPC .NE.  OPC(L) .OR. IC .NE. 1) GO TO 950
       READ(7,1110) DACC,OTC,DOPC,IC, (SR(L,J),J=26,33),(SR(L,J),J=1,8)
       IF (DACC .NE. ACC .OR. DOPC .NE.  OPC(L) .OR. IC .NE. 2) GO TO 950
       READ(7,1110) DACC,OTC,DOPC,IC, (SR(L,J),J= 9,24)
       IF (DACC .NE. ACC .OR. DOPC .NE.  OPC(L) .OR. IC .NE. 3) GO TO 950
       IF (ICOM) 70,70,65
   100 IF (L .GT. 0) GO TO 150
C   NO REFERENCE DATA FOR 'ACC' FOUND IN THE REFERENCE FILE:
       WRITE(6,3100) ACC
       GO TO 10
C   WARNING --- MORE THAN 'MM' REFERENCE DATASETS FOUND IN THE REFERENCE
```

```
C  FILE:
  130 WRITE(6,3200) ACC,MM
      L=L-1
  150 N=L
C  SUBROUTINE 'SETUPD6' DETERMINES THE INPUT REFERENCE DATA REQUIRED TO
C  COMPUTE EACH REQUESTED OUTPUT POWER CONDITION (OPCC):
  155 CALL SETUPD6(IREQ,N,NF,ACC,ITP,IAP,IHP)
C  ADD EXTRA PRINT TO CHECK PROGRAM:
C     WRITE(3,4000) (IREQ(II),II=1,N)
C     WRITE(3,4100) ((IREQC(II,JJ),II=1,3),JJ=1,NP)
C4000 FORMAT(1X,61S)
C4100 FORMAT(1X,16I4)
C  END OF EXTRA PRINTOUT***************
      IF (IPR) 170,170,160
C  SUBROUTINE 'TITPG' PRINTS THE TITLE (COVER) PAGE:
  160 CALL TITPG(IPRR)
C
C  'IPA'        INITIALIZES THE PLOT ARRAYS FOR SUBROUTINES 'OUTG' AND
C  'OUTJ'.
C
      CALL IPA
  170 IPAGE=0
      IC=0
C  LABEL 600 LOOP -- COMPUTE THE PROFILE DATA FOR THE REQUIRED
C  (IREQ(L)=1) RFERENCE DATA POWER CONDITIONS AT THE PROGRAM
C  REFERENCE (RV) AIRSPEED:
      DO 600 L=1,N
      IF (IPRR .EQ. 2) LFLG(L)=0
C  IREQ(L)<1 --- OMIT REFERENCE DATA FOR LTH OPC:
      IF (IREQ(L)) 600,600,510
  510 IPAGE=IPAGE+1
C  IVX --- REFERENCE DATASET AIRSPEED HERE:
      IVX=IV(L)
C
C  COMPUTE MEAN PNL, PNLT, AL AND ALT FROM MEAN SPL SPECTRUM.
C  MEAN PNL ---> ALT ARE STORED IN SR(L,26) ---> SR(L,29)
C  MEAN VALUES ARE PRINTED ON PAGE 'G' AND ALSO USED IN SUBROUTINE
C  'CDIST'.
C
      ID=0
      CALL CAL(L,ID)
      IF (MEAS(1)+MEAS(2)) 535,535,512
  512 CALL CPTC(PTC,L,ID)
      SR(L,33)=PTC
C  COMPUTE ALT(L):
      SR(L,29)=SR(L,26)+PTC
      IF (MEAS(1)) 535,535,515
  515 CALL CPNL(L,ID)
      IF (SR(L,26).GT. 9990.0) GO TO 520
C  COMPUTE PNLT(L):
      SR(L,27)=SR(L,26)+PTC
      GO TO 525
  520 SR(L,27)=9999.0
  525 IF (IPR) 535,535,530
C  PRINT OUTPUT PAGE 'G'.
```

```
  530 CALL OUTG(DRAG,SOURCE)
  535 DO 540 IPROP=1,2
C  COMPUTE SPL, PNL, PNLT, ETC. FOR 22 DISTANCES.
      CALL CDIST(IRD,RV)
C  IRD IS THE INDEX OF THE STANDARD DISTANCE SET, SX(I),
C  CORRESPONDING TO THE REFERENCE DISTANCE, IMS(L).
      IF (IRD .LT. 1) GO TO 940
C  WRITE WARNING MESSAGE WHEN THE REFERENCE DISTANCE IS NOT EQUAL TO
C  1000 FEET (IRD=8):
      IF (IRD .NE. 8) WRITE(6,2910) ACC,OPC(L),IMS(L)
C  SUBROUTINES 'OUTH' AND 'OUTJ' ARE CALLED HERE ONLY IF IPR>0 FOR THE
C  'NP=0' OPTION (IPRR IS SET EQUAL TO 2 BY THE PROGRAM):
      IF (IPR*IPRR-3) 540,538,540
C  SUBROUTINE OUTH PRINTS PAGES 'H', 'I', 'L' AND 'M'.
  538 IPF=1
      CALL OUTH(IRD,IPTC,SENX,IC,IPF)
C  OUTJ(1) PRINTS PAGE 'J' DATA---PLOT OF 'PNLTX'--->'ALX' DISTANCE DATA
C  OUTJ(1) PRINTS PAGE 'N' DATA---PLOT OF 'PNLTX'--->'ALX' DISTANCE DATA
      CALL OUTJ(IPF,SENX,IC)
C  OUTJ(2) PRINTS PAGE 'K' DATA--PLOT OF 'EPNLX'-->'SELTX' DISTANCE DATA
C  OUTJ(2) PRINTS PAGE 'O' DATA--PLOT OF 'EPNLX'-->'SELTX' DISTANCE DATA
      IPF=2
      CALL OUTJ(IPF,SENX,IC)
  540 CONTINUE
  600 CONTINUE
      IF (IPRR .EQ. 2 .AND. IPU .LE. 0) GO TO 710
C  WHEN IPRR=2 AND IPU>0, ENTER LOOP 700 ONLY TO SETUP ARRAY 'PROC' FOR
C  WRITING PROFILE DATA ON FILE 'TAPE3'---NOT VERY EFFICIENT BUT WILL
C  SELDOM APPLY:
C  CALL SUBROUTINE 'DELTA6' FOR EACH OF THE REQUESTED OPCC'S:
      IC=2
      IPAGE=0
      DO 700 L=1,NP
C  VFCT --- AIRSPEED ADJUSTMENT FROM PROGRAM REFERENCE (RV) TO REQUESTED
C  OUTPUT FOR LTH OPCC (KNOTS):
      VFCT=10.0*ALOG10(VX(L)/RV)
C  IVX --- PROFILE DATASET AIRSPEED FOR LTH OPCC:
      IVX=ICV(VX(L))
      LIM=0
      LFLG(L)=0
      IREF(L)=0
      DO 620 I=1,7
      J=JDM(I)
      VFC=0.0
      IF (J .GT. 3) GO TO 605
      VFC=VFCT
      IF (MEAS(J)) 620,620,610
  605 IF (IPR) 620,620,610
  610 LIM=LIM+1
C  COMPUTE AIR-TO-GROUND PROFILE DATA FOR JTH MEASURE:
      CALL DELTA6(PROA(1,1,J),PROC(1,J,1),L,PSIF,PSCF,IREQC,LFLG(L),VFC
     1,LIM,PSC,EXTMX,ITP,IAP,IMP,IREF(L))
C  COMPUTE GROUND-TO-GROUND PROFILE DATA FOR JTH MEASURE:
      CALL DELTA6(PROG(1,1,J),PROC(1,J,2),L,PSIF,PSCF,IREQC,LFLG(L),VFC
     1,IC,PSC,EXTMX,ITP,IAP,IMP,IREF(L))
```

```
  620 CONTINUE
      IF (LFLG(L)) 700,650,650
  650 IF (IPRR-1) 670,660,670
  660 IPAGE=IPAGE+1
      DO 665 IPROP=1,2
C  PRINT PAGE 'I' OR 'M':
      IPF=3
      CALL OUTH(IRD,IPTC,PROC(1,1,IPROP),LFLG(L),IPF)
C  PRINT PAGES 'J' FOR IPROP=1 OR PAGE 'N' FOR IPROP=2:
      IPF=4
      CALL OUTJ(IPF,PROC(1,1,IPROP),LFLG(L))
C  PRINT PAGE 'K' FOR IPROP=1 OR PAGE 'O' FOR IPROP=2:
      IPF=3
  665 CALL OUTJ(IPF,PROC(1,1,IPROP),LFLG(L))
  670 IF (IPU) 700,700,680
C
C  CALL SUB.  'PPFDAT'   TO PUNCH THE EPNLX, SELTX AND/OR SELX PROFILE
C  DATASETS:
C
C  IREF(L)>0 -- SECOND SLOPE REFERENCE REQUIRED BECAUSE
C  PSCF(L) AND PSIF(KB) ARE ON OPPOSITE SIDES OF PSIF(IAP):
  680 ID=0
      IF (IREF(L)-1) 695,685,690
  685 ID=IHP
      GO TO 695
  690 ID=ITP
  695 CALL PPFDAT(PROC,LFLG(L),COMD,ID)
  700 CONTINUE
C     IF (IPR) 10,10,710
C  CALL SUBROUTINE 'SUMRY' TO PRINT SUMMARY PAGE:
  710 CALL SUMRY(IPU,COMD,EXTHX,N,NF,SOURCE,LFLG,IREF,ITP,IAP,IHP)
      GO TO 10
C
C  WRITE ERROR  STATEMENTS.
C
C  ERROR IN REFERENCE DISTANCE:
  940 WRITE(6,2900) ACC,OPC(L),IMS(L)
      GO TO 10
C  REFERENCE DATASET DATA CARD ERROR:
  950 WRITE(6,2760) ACC,ACC,DACC, OPC(L),DOPC,IC
      GO TO 10
C  INPUT/OUTPUT POWER SETTING UNITS ERROR:
  960 WRITE(6,2000) ACC,OPC(L),PSU,(PSDM(I),I=2,6,2)
      GO TO 10
C 970 WRITE(6,2800) ACC
C     DACC=BLK
C     GO TO 10
  999 STOP
C*************************************************************************
C*************************************************************************
 1000 FORMAT(A3,2I3,2(1X,A1),F6.0,I2,A6)
 1001 FORMAT(A10,A6,5I2)
 1010 FORMAT(6(A5,F3.0,2A2))
 1100 FORMAT(3X,A3,A1,A2,6X,I1,3A10,I4,2I5,F5.1)
 1110 FORMAT(3X,A3,A1,A2,6X,I1,16F4.1)
```

```
1200 FORMAT(   8X,A3,A2,A1,3X,A10,A5,1X,2A10,A5)
1205 FORMAT(A1,7X,A3,A2,4X,2A10)
1210 FORMAT(6X,A3,A5,22X,3(A5,1X,A6,2X))
2000 FORMAT(*1   FOR ACC= *,A3,* AND OPC= *,A2/*    POWER SETTING UNITS
    1 READ FROM NORMALIZED DATASET DO NOT MATCH UNITS ON CODE SHEET*/
    2  *     PSU=*,A6/ *     NORMALIZED DATASET UNITS ARE: *,3(A6,2X)/
    3 *     ALL DATA FOR THIS ACC DELETED FROM THIS JOB.*)
2760 FORMAT(*1   OMIT AIRCRAFT = *,A3,* FROM THIS JOB.*/
    1                          *      ERROR IN AIRCRAFT CODE, OPERATION PO
    1WER CODE OR CARD SEQUENCE*// *  ACC = *,A3,*  DACC= *,A3/
    2  *  OPPC=  *,A2,*  OOPC=  *,A2/  *  CARD SEQ NO. = *,I2)
2600 FORMAT(*1   OMIT AIRCRAFT = *,A3,* FROM THIS JOB.*/
    1 *     CODE SHEET PARAMETER NP<1 IS NOT PERMITTED FOR NO-PRINT (IPR
    2=0) MODE.*)
2900 FORMAT(*1   FOR ACC= *,A3,* AND OPC= *,A2/*    ALL DATA OMITTED FO
    1R THIS AIRCRAFT BECAUSE THE REFERENCE DISTANCE=*,I5/4X,*IS NOT WIT
    2HIN 1% OF ANY OF THE STANDARD DISTANCES.*)
2910 FORMAT(*1   FOR ACC= *,A3,* AND OPC= *,A2/*    WARNING --- REFEREN
    1CE DISTANCE=*,I5/4X,*WHICH IS NOT 1000 FEET AS ASSUMED IN SUBROUTI
    2NES DELTA6 AND PPFDAT.*)
3100 FORMAT(*1  NO POWER SETTINGS WERE FOUND FOR AIRCRAFT CODE = *,A3)
3200 FORMAT(*1  NOT ALL REFERENCE DATA WERE READ FOR AIRCRAFT CODE=*,
    1A3/ *    THERE ARE MORE THAN THE MAXIMUM NUMBER (*,I2,*) OF REFEREN
    2CE DATASETS IN THE FILE.*)
C*****************************************************************
C*****************************************************************
      END
```

```
      SUBROUTINE ALPH(REL,TEMP,ABC,IL,IH)
C  DECK 1   ALPH
C*****************************************************************
C
C     IN THIS SUBROUTINE, THE PROCEDURE USED TO CALCULATE THE COEFFICIENTS
C     OF ATMOSPHERIC ABSORPTION IS THE SAME AS DESCRIBED IN SAE ARP 866A.
C
C     SUBROUTINE ALPH(REL,TEMP,ABC,IL,IH)
C      WHERE.....
C        REL  - RELATIVE HUMIDITY IN PERCENT
C        TEMP - TEMPERATURE IN DEGREES FAHRENHEIT
C        ABC  - ARRAY CONTAINING THE COMPUTED COEFFICIENTS OF ATMOSPHERIC
C               ABSORPTION IN DB PER 1000 FEET
C        IL   - FIRST BAND FOR WHICH ABC IS COMPUTED (IL=1 CORRESPONDS TO
C               BAND NUMBER 17).
C        IH   - LAST BAND FOR WHICH ABC IS COMPUTED (IH=24 CORRESPONDS TO
C               BAND NUMBER 40).
C
C*****************************************************************
C*****************************************************************
C**                                                             **
C**       IN THIS SUBROUTINE IBL=17 CORRESPONDS TO IL=1 AND IBH=40  **
C**       CORRESPONDS TO IH=24.  IF THIS IS CHANGED IN THE PROGRAM,  **
C**       THIS SUBROUTINE MUST BE CHANGED ACCORDINGLY.           **
C**       ABC(J) IS ONLY COMPUTED FOR 1/3 OCTAVE BANDS 17 TO 40.  **
C**       IF IBL AND IBH ARE OUTSIDE THIS RANGE, CHANGES MUST BE  **
C**       MADE IN THIS SUBROUTINE TO LIMIT COMPUTATIONS TO THIS RANGE. **
C**                                                             **
C*****************************************************************
C
C     NOTE:
C     THE FOLLOWING COMMENT CARDS CONTAIN  SOME OF THE EQUATIONS AS
C     DEFINED IN SAE ARP 866A.
C        THE FOLLOWING F(TEMP,REL) IS THE SAME AS DEFINED IN THE PROGRAM
C        BELOW:
C        F(TEMP,REL)=10.0**(ALOG10(REL)-1.9727464+0.02288074*TEMP
C       1-0.00009589*TEMP**2+0.0000003*TEMP**3)
C        ALMX=FT1*FREQ IS THE SAME AS THE FOLLOWING:
C        ALMX=10.0**(ALOG10(FREQ)-2.4215+0.281*TEMP/60.0)
C        FT2*(FREQ**2.05)  IS THE SAME AS THE FOLLOWING:
C        10.0**(2.05*ALOG10(FREQ/1000.0)+0.000633*TEMP-1.45325)
C        THE FOLLOWING TWO CARDS ARE REPLACED BY LABEL 60 IN THE PROGRAM:
C     50 ALM=ALMX*ALN
C        ABC(J)=ALM+10.0**(2.05*ALOG10(FREQ/1000.0)+0.000633*TEMP-1.45325)
C
C*****************************************************************
C*****************************************************************
      DIMENSION X(29),Y(29),FREQ3(24),ABC(24)
      F(TEMP,REL)=0.01064764002*REL*10.0**(0.02288074*TEMP
     1-0.00009589*TEMP**2+0.0000003*TEMP**3)
      DATA FREQ3/50.0,63.0,80.0,100.0,125.0,160.0,200.0,250.0,315.0,
     A400.0,500.0,630.0,800.0,1000.0,1250.0,1600.0,2000.0,2500.0,3150.0,
     B4000.0,4470.0,5612.0,7096.0,8943.0/
      DATA X/0.0,0.25,0.50,0.6,0.7,0.8,0.9,1.0,1.1,1.2,1.3,1.5,1.7,2.0,
     A2.3,2.5,2.8,3.0,3.3,3.6,4.15,4.45,4.8,5.25,5.7,6.05,6.5,7.0,10.0/
```

```
      DATA Y/0.0,0.315,0.700,0.84,0.93,0.975,0.996,1.0,0.97,0.9,0.84,
     A0.75,0.67,0.57,0.495,0.45,0.4,0.37,0.33,0.3,0.26,0.245,0.23,0.22,
     B0.21,0.205,0.2,0.2,0.2/
    4 IF (IH .GT. 24) IH=24
      HA=F(TEMP,REL)
      FT1=0.003788785337*10.0**(0.004683333333*TEMP)
      FT2=2.49315913602E-6*10.0**(0.000633*TEMP)
      DO 100 J=IL,IH
      FREQ=FREQ3(J)
   15 HMX=(FREQ/1010.0)**0.5
      HN=HA/HMX
      IF (HN-6.50) 30,20,20
   20 ALN=0.2
      GO TO 60
   30 IF (HN) 40,40,50
   40 ALN=0.0
      GO TO 60
   50 ALN=ATKN(X,Y,29,2,HN)
   60 ABC(J)=FREQ*FT1*ALN+FT2*(FREQ**2.05)
  100 CONTINUE
      RETURN
      END
```

```
      FUNCTION ATKN(X,Y,N,K,XI)
C  DECK 2   ATKN
C*****************************************************************
C*****************************************************************
C
C     ATKN      AITKEN INTERPOLATING FUNCTION ADAPTED TO THE OMEGA 5
C               PROGRAM;  USED BY SUBROUTINE ALPH.
C
C     USAGE...
C
C     Z=ATKN(X,Y,N,K,XI)
C
C        WHERE...
C
C        X - TABLE OF INDEPENDENT VARIABLE VALUES IN ASCENDING ORDER.
C        Y - TABLE OF DEPENDENT VARIABLE VALUES.
C        N - NO. OF POINTS IN TABLES X AND Y (29).
C        K - DEGREE OF INTERPOLATION DESIRED (2).
C        XI- X-VALUE FOR WHICH INTERPOLATION IS DESIRED.
C
C        THE INTEPOLATED VALUE IS RETURNED AS THE FUNCTION VALUE.
C
C*****************************************************************
C*****************************************************************
      DIMENSION   X(N), Y(N)
      DIMENSION XX(13),YY(13)
      K1=K+1
   10 IF (XI-X(1)) 20,20,30
   20 LL=0
      GO TO 200
   30 IF (X(N)-XI) 40,40,50
   40 LL=N-K1
      GO TO 200
   50 LL=1
      LU=N
   60 IF (LU-LL-1) 180,180,70
   70 LI=(LL+LU)/2
      IF (X(LI)-XI) 80,80,90
   80 LL=LI
      GO TO 60
   90 LU=LI
      GO TO 60
  180 LL=LL-(K1+1)/2
      IF (LL) 20,200,190
  190 IF (LL+K1-N) 200,200,40
  200 DO 210 I=1,K1
      I1=LL+I
      XX(I)=X(I1)-XI
  210 YY(I)=Y(I1)
      DO 220 I=1,K
      DO 220 J=I,K
  220 YY(J+1)=(1./(XX(J+1)-XX(I)))*(YY(I)*XX(J+1)-YY(J+1)*XX(I))
      ATKN=YY(K1)
      RETURN
      END
```

```
      FUNCTION ICV(DR)                                                  014280
C   DECK 3  CONVERTS DATA FROM FLOATING POINT TO INTEGER.               014300
      R=DR                                                              014320
      ICV=R                                                             014340
      DD=R-FLOAT(ICV)                                                   014350
      IF (ABS(DD) .GE. 0.499999) ICV=ICV+ISIGN(1,ICV)                   014380
      RETURN                                                            014400
      END                                                               014420
```

```
      SUBROUTINE HEAD(IP)
C   DECK 4
C*****************************************************************
C
C   SUBROUTINE 'HEAD' PRINTS THE HEADING BLOCKS FOR PAGES H, I, L AND M.
C
C*****************************************************************
      DIMENSION PG(10),DH1(7),DH2(3,2),DI1(2),PAG(12)
      COMMON IBNL,IBNH,L
      COMMON /COMPC/IV(6),IMS(6),P(2,6),OPC(6),OPCC(12),PS(2,6),PSC(12),
     1 PSU,PSIF(6),PSCF(12),IREQC(3,12),VX(12),SX(22),ATNC(24),ATNR(24),
     2 DELN,IPTC,IPROP,MEAS(3),JPRC(12),PC(2,12)
      COMMON /HEADC/ AC,DATE,ACC,IPAGE,IVX,ITEMP,IRHUM,IVER,PV,CRI,
     1 ET(2),OTC
      DATA PG/1HA,1HB,1HC,1HD,1HE,1HF,1HH,1HI,1HL,1HM/,BLK/1H /
     1,PAG/1H1,1H2,1H3,1H4,1H5,1H6,1H7,1H8,1H9,2H10,2H11,2H12/
      DATA ASK/1H*/,   DH1/10HSOUND PRES,10HSURE LEVEL,10H SPECTRA A,
     B 10HS A FUNCTI,10HON OF SLAN,10HT DISTANCE,6H (DB)*/,DH2/10HAIR-TO
     C-GRO, 10HUND PROPAG, 5HATION,  10HGROUND-TO-,10HGROUND PRO,
     D 10HPAGATION  /, DI1/10HSINGLE EVE,10HNT NOISE A/
C
C   IP = 7 THROUGH 8 CORRESPONDS TO PAGES H, I, L AND M.
C
      IF (IP .EQ. 8) GO TO 220
  210 WRITE(6,3000) DH1,     (DH2(I,IPROP),I=1,3),IVER
      GO TO 250
  220 WRITE(6,3000) DI1,DH1(4),DH1(5),DH1(6),ASK,BLK,(DH2(I,IPROP),I=1,3
     1),IVER
  250 IPP=IP+2*IPROP-2
  260 WRITE(6,3050) ACC
      WRITE(6,3100) PC(1,L),PC(2,L),ITEMP,OTC, OPCC(L)
      WRITE(6,3110) AC,PSC(L),PSU,IRHUM,PV
      WRITE(6,3150)       DATE,IVX,DELN,    PG(IPP),PAG(IPAGE)
 3000 FORMAT(1H1/10X,1H(, 106(1H-),1H)/ 10X,*( TABLE:   *,7A10, 8X,*)IDE
     1NTIFICATION:  )*/ 10X,1H(, 88X,1H),17X,1H)/ 10X,1H(,10X, 3A10,48X,
     2   *)  OMEGA 10.*,I1,5X,1H))
 3050 FORMAT( 10X,1H(, 88(1H-),1H),17X,1H)/ 10X,11H( AIRCRAFT:, 18X,
     1 12H( OPERATION:, 19X, 14H) METEOROLOGY:, 15X, 13H)  A/C CODE: ,
     2 A3, 3H  ))
 3100 FORMAT( 10X,1H(, 28X,1H(,4X,2A10,6X,1H),7X,4HTEMP,6X,1H=,I3,2H F,
     1 5X,13H)  OPS CODE: ,A1,A2,3H  ))
 3110 FORMAT( 10X,1H(, 10X,A10,8X,1H(,4X,A5,1X,A6,14X,  1H),7X,
     1 11HREL HUMID =,I3,2H %,5X,3H)  ,13HPROFILE VER: ,A1,2H ))
 3150 FORMAT( 10X,1H(, 28X,1H(,30X,                1H),28X,1H),2X,A10,5X,1H)
     1/ 10X,1H(,28X,1H(, 4X,10HAIRSPEED =,I4,6H KNOTS,6X,11H) DELTA N =
     2, F5.1,3H DB,10X, 9H)  PAGE  ,A1,A2,6X,1H)/ 10X,1H(,106(1H-),1H))
      RETURN
      END
```

```
      SUBROUTINE IPA
C  DECK 5
C***********************************************************************
C
C   SUBROUTINE 'IPA' INITIALIZES THE PLOT ARRAYS USED BY SUBROUTINES
C   'OUTG' AND 'OUTJ'.
C
C***********************************************************************
      DIMENSION ORDJ(22)
      COMMON /OUTG/ORD(43),ISC(9),IORD(28),DASH,DOT,X,BLK,DATEN,
     1 PB(84),PD(84),PM(84)
      DATA ORDJ/1HS,1HL,1HA,1HN,1HT,1H ,1HD,1HI,1HS,1HT,1HA,1HN,1HC,1HE,
     1    1H ,1HI,1HN,1H ,1HF,1HE,1HE,1HT/
C
C   SET UP PLOT ARRAYS FOR TAB PLOTS PRINTED BY SUBROUTINES 'OUTG' AND
C   'OUTJ' (PB, PD AND PM).
C
  815 DO 820 I=1,83,2
      PD(I)=DOT
      PB(I)=BLK
      PM(I)=DASH
      K=I+1
      PD(K)=BLK
      PM(K)=DASH
  820 PB(K)=BLK
      DO 830 I=3,83,10
  830 PB(I)=DOT
      DO 840 I=1,22
      K=I+10
  840 ORD(K)=ORDJ(I)
      DO 850 I=1,10
      K=I+32
      ORD(I)=BLK
  850 ORD(K)=BLK
      ORD(43)=BLK
  900 RETURN
      END
```

```
      SUBROUTINE OUTG(DRAG,SOURCE)
C  DECK 6   OUTG
C*****************************************************************
C
C  SUBROUTINE 'OUTG' PRINTS A TAB PLOT OF THE NORMALIZED SPL
C  VERSUS FREQUENCY AND PRINTS THE PNLT, PNL, ALT AND AL DATA
C  COMPUTED FROM THIS NORMALIZED SPECTRUM.  ALL DATA ARE FOR THE L-TH
C  POWER SETTING.  ADDITIONAL REFERENCE AND IDENTIFICATION DATA READ
C  FROM THE REFERENCE DATASET ARE ALSO PRINTED BELOW THE PLOT.
C
C*****************************************************************
      DIMENSION FQ(24),PB(75),DRAG(3,6),SOURCE(2,6)
      COMMON IBNL,IBNH,L,SR(6,33),NR(6),ISRC(24)
      COMMON /COMPC/IV(6),IMS(6),P(2,6),OPC(6),OPCC(12),PS(2,6),PSC(12),
     1 PSU,PSIF(6),PSCF(12),IREQC(3,12),VX(12),SX(22),ATNC(24),ATNR(24),
     2 DELN,IFTC,IPROP,MEAS(3),OPCR(12),PC(2,12)
      COMMON /HEADC/ AC,DATE,ACC,IPAGE,IVX,ITEMP,IRHUM,IVER,PV,CRI,
     1 ET(2),OTC
      COMMON /OUTC/ORD(44),ISC(6),IORD(28),DASH,DOT,X,BLK,DATEN,PP(84,3)
      EQUIVALENCE (PP(1,1),PB(1))
      DATA FQ/4*(1H ),1HF,1HR,1HE,1HQ,1HU,1HE,1HN,1HC,1HY,1H ,1HI,1HN,
     1 1H ,1HH,1HZ,5*(1H )/
C  PRINT 'ID' BLOCK IN UPPER RIGHT CORNER:
      WRITE(6,2000) IVER,ACC,OTC, OPC(L),DATE,IPAGE
      WRITE(6,2100)
      WRITE(6,2150) PB,BLK
      MX=-1000
C  COMPUTE THE LARGEST 'SPL' VALUE:
      DO 25 J=IBNL,IBNH
      ISRC(J)=ICV(SR(L,J))
      MX=MAX0(MX,ISRC(  J))
   25 CONTINUE
      MX=((MX+7)/10)*10
C  COMPUTE THE ABSCISSA SCALE:
      DO 40 I=1,8
      J=9-I
   40 ISC(J)=MX-10*I+10
      MX=MX+2
      MN=ISC(1)-2
      IFQ=0
      DO 150 J=IBNL,IBNH
      IFQ=IFQ+1
C  COMPUTE THE PLOT POSITION OF 'SPL' VALUE IN ISRC(J):
      II=ISRC(  J)-MN+1
      IF (II .LT. 1 .OR. II .GT. 75) II=0
C
C  IFQ  IS USED TO SET UP THE GRID PATTERN WHICH REPEATS EVERY 10 LINES.
C  LG=1 ---> PRINTS 5 DOTS PER INCH ON TAB PLOT.
C  LG=2 ---> PRINTS 1 DOT  PER INCH ON TAB PLOT.
C
      GO TO (60,75,75,60,75,75,60,75,75,70),IFQ
   60 LG=2
      GO TO 80
   70 IFQ=0
   75 LG=1
```

```
   80 IF (II) 100,100,90
   90 SAVE=PP(II,LG)
      PP(II,LG)=X
C  PRINT THE PLOT LINE:
  100 WRITE(6,2300) FQ(J),IORD(J),(PP(I,LG),I=1,75),SR(L,J)
      IF (II) 150,150,140
  140 PP(II,LG)=SAVE
  150 CONTINUE
      WRITE(6,2150) PB
      WRITE(6,2100)
C  PRINT THE ABSCISSA SCALE:
      WRITE(6,2400) ISC
C
C  MEAN PNL, PNLT, AL AND ALT ARE STORED IN SR(L,26) ---> SR(L,29).
C  MEAN PNL, PNLT, AL AND ALT WERE COMPUTED FROM THE MEAN SPL SPECTRUM
C  IN THE MAIN DECK.
C
C  PRINT THE REFERENCE DATA SUMMARY BELOW THE TAB PLOT:
      WRITE(6,2500) AC,P(1,L),P(2,L),PS(1,L),PS(2,L),IV(L),SR(L,27),
     1 IMS(L),SR(L,26),SR(L,29)
      WRITE(6,2600) NR(L),IVER,ACC,OTC, OPC(L),DATEN,SR(L,28)
      WRITE(6,2700) SR(L,33),SOURCE(1,L),SOURCE(2,L),SR(L,30),ET,SR(L,31
     1),(DRAG(I,L),I=1,3),SR(L,32),SR(L,25)
      RETURN
 2000 FORMAT(1H1/120X9HOMEGA 10.,I1//120X,10HA/C CODE: ,A3/  120X,10HOPS
     1 CODE: ,A1,A2/  120X, 6HDATE: ,A10// 120X, 7HPAGE  G,I1///)
 2100 FORMAT(20X,1H(,75(1H-),1H))
 2150 FORMAT(20X,1H(,75A1,1H),A1,5H MEAN)
 2300 FORMAT( 13X,A1,I5,2H (,75A1,1H),F6.1)
 2400 FORMAT( 15X,8I10/39X,41HMEAN VALUE OF NORMALIZED 1/3 OB SPL IN DB)
 2500 FORMAT(//28X,A10,5X,2A10,5X,A5,1X,A6//       16X,6HAIRSPEED, 7X,1H=
     1,I5,6H KNOTS,10X,4HTEMP, 6X, 7H=  59 F,18X,6HPNLT =,F6.1,5H PNDB/
     2                                16X,16HSLANT DISTANCE =,I5, 5H FEET,
     3 11X, 17HREL HUMID =  70 %,18X,6HPNL  =,F6.1,5H PNDB/ 88X,6HALT  =
     4,F6.1,4H DBA)
 2600 FORMAT(  16X, 16HNO. OF RECORDS =,I5, 16X, 10HIDENT: 10.,I1,1H-,A3
     1,1H-,A1,A2,1H-,A5, 9X,6HAL   =,F6.1,4H DBA)
 2700 FORMAT(88X,*C    =*,F6.1,* DB*/16X,*DATA FROM *,A10,
     1* JOB COMPUTED ON *,A10,25X,*EPNL =*,F6.1,* EPNDB*/
     2 16X,*ENGINE TYPE: *,A10,A5,44X,*SEL  =*,F6.1,* DB*/
     3 16X,*DRAG CONFIGURATION: *,2A10,A5,27X,*SELT =*,F6.1,* DB*/
     4 88X,*THETA=*,F6.1,* DEG*)
      END
```

```
      SUBROUTINE CDIST(IRD,RV)
C  DECK 7   CDIST
C*******************************************************************
C
C  SUBROUTINE 'CDIST' COMPUTES THE SPL AND SINGLE EVENT NOISE DATA FOR
C  22 DISTANCES FOR AIR-TO-GROUND (IPROP=1) AND GROUND-TO-GROUND
C  (IPROP=2) CONDITIONS.
C
C  NOTE: ARRAYS SPLA( 6,24) ---> CA( 6) ARE EQUIVALENT TO SR( 6,33) IN
C        THE MAIN DECK.  THESE ARRAYS CONTAIN THE MEAN DATA (FOR EACH
C        POWER SETTING) PRINTED ON PAGE 'G'.
C
C  NOTE: ARRAYS SPLX(22,24) ---> SELX(22) ARE THE SINGLE EVENT NOISE
C        DATA FOR 22 DISTANCES PRINTED ON PAGES 'H', 'I', 'L' AND 'M'
C        FOR IPRR=2 (IPRR=2 ONLY WHEN NP=0 AND IPR=1 ON THE CODE SHEET);
C        THE PNLTX, PNLX ---> SELX DATA ARE STORED AT THE REFERENCE
C        AIRSPEED.  THE EPNLX, SELTX, AND SELX DATA STORED IN PRDA
C        AND PRDG ARE ADJUSTED TO THE PROGRAM REFERENCE AIRSPEED (RV).
C
C  NOTE: EA(13,13) IS DEFINED ONLY FOR FREQUENCIES 50 (B=17) TO 800 HZ
C        (B=29) AND DISTANCES 400 FEET TO 6300 FEET.
C        EA=0 FOR SX(I)<400 FEET
C        EA=EA(13,J) FOR SX(I)> 6300 FEET.
C
C*******************************************************************
      DIMENSION  EA(13,13),D2X(22)
      COMMON IBNL,IBNH,L,SPLA(6,24),THETA(6),
     1 PNLA( 6),PNLTA( 6),ALA( 6),ALTA( 6),EPNLA( 6),SELA( 6),SELTA( 6),
     2 CA( 6), NR( 6),ISPL(24),SPLX(22,24),
     3 PNLTX(22),PNLX(22),ALTX(22),ALX(22),EPNLX(22),SELTX(22),SELX(22)
     4 ,PRDA(22,6,7),PRDG(22,6,7)
      COMMON /COMPC/IV(6),IMS(6),P(2,6),OPC(6),OPCC(12),PS(2,6),PSC(12),
     1 PSU,PSIF(6),PSCF(12),IREQC(3,12),VX(12),SX(22),ATNC(24),ATNR(24),
     2 DELN,IPTC,IPROP,MEAS(3),OPCR(12),PC(2,12)
      DATA EA/    0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 1.09, 2.61,
     1 4.53, 6.94,10.04,13.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 1.18,
     2 2.60, 4.57, 6.94, 9.93,12.53,15.00, 0.00, 0.00, 0.00, 0.00,  .00,
     3 1.04, 2.34, 3.96, 6.05, 8.55,11.92,14.53,17.00, 0.00, 0.00, 0.00,
     4  .38, 1.25, 2.35, 3.74, 5.48, 7.68,10.44,13.92,16.53,19.00, 0.00,
     5  .13,  .66, 1.36, 2.25, 3.35, 4.74, 6.48, 8.68,11.44,14.92,17.53,
     620.00,  .19,  .63, 1.18, 1.88, 2.75, 3.85, 5.24, 6.98, 9.18,11.94,
     715.42,18.03,20.50,  .19,  .63, 1.18, 1.88, 2.75, 3.85, 5.24, 6.98,
     8 9.18,11.94,15.42,18.03,20.50, 0.00,  .13,  .66, 1.36, 2.25, 3.35,
     9 4.74, 6.48, 8.68,11.44,14.92,17.53,20.00, 0.00, 0.00, 0.00, 0.00,
     A  .15, 1.02, 2.11, 3.48, 5.21, 7.39,10.14,13.64,17.00, 0.00, 0.00,
     B 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 1.41, 3.20, 5.45, 8.28,11.00,
     C 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00,  .12, 1.03, 2.17,
     D 3.62, 5.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00,
     E 0.00,  .68, 1.66, 3.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00,
     F 0.00, 0.00, 0.00, 0.00,  .39, 1.00/
C  DG IS THE GROUND-TO-GROUND CORRECTION FACTOR USED INSTEAD OF
C  CHANGING EXCESS ATTENUATION DATA---ADDED TO THE OMEGA 6 PROGRAM ON
C  25 MAR 1975.
      DATA DG/5.0/
      H0=FLOAT(IMS(L))
```

```
      VREF=FLOAT(IV(L))
C  ALGV IS FROM OMEGA 6 PROGRAM.
      ALGV=10.0*ALOG10(VX(L)/VREF)
C  VFCT --- FACTOR USED TO ADJUST DATA TO THE PROGRAM REFERENCE
C            AIRSPEED (RV):
      VFCT=10.0*ALOG10(RV/VREF)
      IF (IPROP-1) 10,10,40
C
C  AIR-TO-GROUND DISTANCE DATA (IPROP=1).
C
   10 SNTH=SIN(THETA(L)/57.29563)*1000.0
C  IRD IS THE INDEX OF THE STANDARD DISTANCE SET, SX(I),
C  CORRESPONDING TO THE REFERENCE DISTANCE,H0.
      IRD=0
   20 DO 30 I=1,22
      D3=SX(I)*0.01
      IF (H0 .GE. (SX(I)-D3) .AND. H0 .LE. (SX(I)+D3)) IRD=I
      D1=20.0*ALOG10(SX(I)/H0)
C     D2X(I)=0.5*D1-ALGV
      D2X(I)=0.3*D1
      D1=DELN-D1
      DO 25 J=IBNL,IBNH
      D2=(SX(I)*ATNC(J)-H0*ATNR(J))/SNTH
   25 SPLX(I,J)=SPLA(L,J)-D2+D1
   30 CONTINUE
      IF (IRD .LT. 1) RETURN
      GO TO 90
C
C  GROUND-TO-GROUND DISTANCE DATA (IPROP=2).
C  THE SPLX DATA WERE DEFINED BY THE PREVIOUS 'IPROP=1' AIR-TO-GROUND
C  PASS:
C
   40 DO 80 J=1,13
      DO 60 I=4,16
   60 SPLX(I,J)=SPLX(I,J)-EA(I-3,J)
      DO 70 I=17,22
   70 SPLX(I,J)=SPLX(I,J)-EA( 13,J)
   80 CONTINUE
      DO 85 J=IBNL,IBNH
      DO 85 I=1,22
   85 SPLX(I,J)=SPLX(I,J)-DG
   90 ID=1
C  LABEL 150 LOOP -- COMPUTE THE REQUESTED SINGLE EVENT DATA FOR
C                    EACH DISTANCE:
C  FOR EPNLX --- ALL COMPUTATIONS ARE REQUIRED;
C  FOR SELTX --- ALL COMPUTATIONS EXCEPT 'PNLX' ARE REQUIRED;
C  FOR SELX  --- ONLY 'ALX' COMPUTATIONS ARE REQUIRED.
      DO 150 I=1,22
      IF (MEAS(1)) 94,94,91
C  CALL SUBROUTINE 'CPNL' TO COMPUTE PNLX(I)
   91 CALL CPNL(I,ID)
      IF (PNLX(I)-9990.0) 95,92,92
   92 IF (I .LE. 2) GO TO 95
C  IF PNLX(I)>9990.0, EXTRAPOLATE PNLX(I) FROM PREVIOUS TWO
C  PNLX(I) DATA POINTS.
```

```
      PNLX(I)=2.0*PNLX(I-1)-PNLX(I-2)
      GO TO 95
   94 PNLX(I)=9999.
C  CALL SUBROUTINE 'CPTC' TO COMPUTE TONE CORRECTION (PTC) FOR THE I-TH
C  SPECTRA (OR DISTANCE).
   95 IF (MEAS(1)+MEAS(2)) 130,130,98
   98 CALL CPTC(PTC,I,ID)
      IF (PNLX(I)-9990.0) 100,120,120
  100 PNLTX(I)=PNLX(I)+PTC
      IF (PNLTA(L)-9990.0) 110,125,125
  110 EPNLX(I)=EPNLA(L)+PNLTX(I)-PNLTA(L)   +D2X(I)
      GO TO 130
  120 PNLTX(I)=9999.0
  125 EPNLX(I)=9999.0
C  CALL SUBROUTINE 'CAL'  TO COMPUTE ALX(I).
  130 CALL CAL(I,ID)
      SELX(I)=SELA(L)+ALX(I)-ALA(L)   +D2X(I)
      IF (MEAS(1)+MEAS(2)) 140,140,135
  135 ALTX(I)=ALX(I)+PTC
      SELTX(I)=SELTA(L)+ALTX(I)-ALTA(L)   +D2X(I)
C  ***** SEE COMMENT LINES BEFORE LABEL 200 BELOW; THEY EXPLAIN
C        ARRAYS 'PRDA' AND 'PRDG' USED BELOW:
  140 IF (IPROP-1) 144,144,147
C  STORE AIR-TO-GROUND DATA (IPROP=1):
  144 PRDA(I,L,3)=SELX(I)-VFCT
      GO TO 150
C  STORE GROUND-TO-GROUMND DATA (IPROP=2):
  147 PRDG(I,L,3)=SELX(I)-VFCT
  150 CONTINUE
C  IPTC --- INDEX OF FREQUENCY BAND WHICH DETERMINED THE TONE CORRECTION
C           FOR THE REFERENCE DISTANCE SPECTRUM:
      IPTC=ISPL(IRD)
C
C  FROM HERE TO LABEL 200---SMOOTHING ROUTINE FOR ALTX(I), PNLTX(I),
C  SELTX(I) AND EPNLX(I).
C
      IF (MEAS(1)+MEAS(2)) 999,999,155
  155 C1=SELTX(IRD)-SELX(IRD)
      C2=ALTX(IRD)-ALX(IRD)
      DO 220 I=1,22
      C3=      SELTX(I)-SELX(I)
      IF (I-14) 160,165,165
  160 D3=1.0
      GO TO 180
  165 IF (I-16) 170,175,175
  170 D3=0.2*FLOAT(18-I)
      GO TO 180
  175 D3=0.0
C  COMPUTE SMOOTHED SELTX AND ALTX:
  180 SELTX(I)=SELX(I)+C1*D3
      ALTX(I)=ALX(I)+C2*D3
      IF (PNLX(I)-9990.0) 185,190,190
C  COMPUTE SMOOTHED EPNLX AND PNLTX:
  185 PNLTX(I)=PNLX(I)+C2*D3
C  SMOOTHED EPNLX= UNSMOOHED EPNLX + SMOOTHED SELTX - UNSMOOTHED SELTX:
```

```
      EPNLX(I)=EPNLX(I)+C1*D3-C3
      GO TO 200
  190 PNLTX(I)=9999.0
      EPNLX(I)=9999.0
C  APPLY AIRSPEED ADJUSTMENT FROM INPUT (IV(L)) TO PROGRAM REFERENCE(RV)
C  STORE DATA FOR PRINTOUT OF PROFILE DATASET BY SUBROUTINE 'PPFDAT'
C  AND/OR FOR DELTA-6 COMPUTATIONS BY SUBROUTINE 'DELTA6':
  200 IF (IPROP-1) 210,210,215
C  STORE AIR-TO-GROUND DATA (IPROP=1):
  210 PROA(I,L,1)=EPNLX(I)-VFCT
      PROA(I,L,2)=SELTX(I)-VFCT
      PROA(I,L,4)=PNLTX(I)
      PROA(I,L,5)=PNLX(I)
      PROA(I,L,6)=ALTX(I)
      PROA(I,L,7)=ALX(I)
      GO TO 220
C  STORE GROUND-TO-GROUND DATA (IPROF=2):
  215 PROG(I,L,1)=EPNLX(I)-VFCT
      PROG(I,L,2)=SELTX(I)-VFCT
      PROG(I,L,4)=PNLTX(I)
      PROG(I,L,5)=PNLX(I)
      PROG(I,L,6)=ALTX(I)
      PROG(I,L,7)=ALX(I)
  220 CONTINUE
  999 RETURN
      END
```

```
      SUBROUTINE CPNL(I,ID)
C     DECK 6   CPNL
C***********************************************************************
C
C     SUBROUTINE CPNL(I,ID) COMPUTES PERCEIVED NOISE LEVEL (PNL) USING THE
C     METHOD DESCRIBED IN FAR PART 36 SECTION B36.2.  FUNCTION FNOY (SEE
C     DECK  9) IS USED TO COMPUTE THE NOY VALUES.
C
C     PERTINENT VARIABLES USED BY CPNL ARE:
C        SPLX        - ARRAY CONTAINING SOUND PRESSURE LEVEL DATA IN DB
C        SPLA        - ARRAY CONTAINING NORMALIZED SOUND PRESSURE LEVEL DATA
C                      IN DB
C        PNLX        - PERCEIVED NOISE LEVEL IN PNDB
C        PNLA        - PERCEIVED NOISE LEVEL IN PNDB COMPUTED FROM SPLA
C        I           - INDEX OF SPL SPECTRUM FOR WHICH PNL IS BEING COMPUTED
C        ID          - IDENTIFIES THE SPL DATA USED TO COMPUTE THE PNLX
C                      OR PNLA DATA. ID=0---SPLA,  ID=1---SPLX.
C
C***********************************************************************
C***********************************************************************
C**                                                                   **
C**        PNL(I) IS ONLY COMPUTED FOR BANDS 17 TO 40.                **
C**        IF IBL AND IBH ARE OUTSIDE THIS RANGE, CHANGES MUST BE     **
C**        MADE IN THIS SUBROUTINE TO LIMIT COMPUTATIONS TO THIS RANGE. **
C**                                                                   **
C***********************************************************************
      COMMON IBNL,IBNH,L,        SPLA( 6,24),THETA( 6),PNLA( 6),DMYY(72)
     1,        SPLX(22,24),PNLTX(22),PNLX(22)
      FJ=0.15
      SUM=0
      AMX=-10.0
      DO 60 J=IBNL,IBNH
      JJ=J
      IF (ID) 20,20,30
   20 SPLL=SPLA(I,J)
      GO TO 40
   30 SPLL=SPLX(I,J)
C     MAXIMUM SPL IN NOY ALGORITHM IS 150.0
   40 IF (SPLL.GT. 150.00001) GO TO 70
C
C     USE FUNCTION FNOY TO COMPUTE NOY VALUE (FN) FOR SOUND PRESSURE LEVEL
C     SPLL AND ADJUSTED BAND NUMBER JJ.
C
      FN=FNOY(SPLL,JJ)
C     MAXIMUM PERMITTED NOY VALUE IS 2048.0
      IF (FN .GT. 2048.0001) GO TO 70
      AMX=AMAX1(AMX,FN)
      SUM=SUM+FN
   60 CONTINUE
      IF (SUM .LE. 0.0001) GO TO 70
      SUM=(SUM-AMX)*FJ+AMX
C     COMPUTE PERCEIVED NOISE LEVEL (PNL) FOR THE I-TH SPECTRUM.
      PNL=   40.0+33.3*ALOG10(SUM)
      GO TO 100
   70 PNL=    9999.0
```

```
100 IF (ID) 110,110,120
110 PNLA(I)=PNL
    RETURN
120 PNLX(I)=PNL
    RETURN
    END
```

```
      FUNCTION FNOY(SPL,JJ)
C     DECK 9  FNOY
C*************************************************************************
C
C    FUNCTION FNOY(SPL,JJ) COMPUTES THE NOY VALUE FOR A GIVEN SOUND
C    PRESSURE LEVEL (SPL) AND 1/3 OCTAVE BAND CENTER FREQUENCY (JJ) USING
C    THE METHOD DESCRIBED IN ARP 865A.  (THIS DIFFERS FROM THE METHOD
C    DESCRIBED IN FAR PART 36 SECTION 536.7 IN THAT IT COMPUTES THE NOY
C    VALUE DOWN TO 0.1 INSTEAD OF STOPPING AT 1.0)
C
C    VARIABLES REQUIRED BY FUNCTION FNOY ARE:
C       SPL - SOUND PRESSURE LEVEL IN DB
C       JJ  - ARRAY INDEX CORRESPONDING TO A BAND NUMBER
C       FL  - ARRAY CONTAINING THE BAND SOUND PRESSURE LEVELS FROM TABLE
C             II OF ARP 865A.
C       FM  - ARRAY CONTAINING THE RECIPROCALS OF THE SLOPES GIVEN IN
C             TABLE II OF ARP 865A.
C
C*************************************************************************
      DIMENSION FL(24,5),FM(24,4)
      DATA FL/49.,44.,39.,34.,30.,27.,24.,21.,18.,5*16.,15.,12.,9.,5.,
     A4.,5.,6.,10.,17.,21.,55.,51.,46.,42.,39.,36.,33.,30.,27.,5*25.,
     B23.,21.,18.,15.,2*14.,15.,17.,23.,29.,64.,60.,56.,53.,51.,48.,46.,
     C44.,42.,5*40.,38.,34.,32.,30.,2*29.,30.,31.,37.,41.,91.01,85.88,
     D87.32,79.85,79.76,75.96,73.96,74.91,94.63,13*100.0,44.29,50.72,
     E52.,51.,49.,47.,46.,45.,43.,42.,41.,5*40.,38.,34.,32.,30.,2*29.,
     F30.,31.,34.,37./
      DATA FM/0.079520,2*0.06816,0.05964,10*0.053013,0.059640,2*0.053013
     G,2*0.047712,2*0.053013,0.068160,0.079520,0.059640,2*0.058098,
     H0.052288,0.047534,2*0.043573,0.040221,0.037349,7*0.034859,0.040221
     I,0.037349,4*0.034859,2*0.037349,0.043573,0.043478,0.040570,
     J2*0.036631,0.035336,2*0.033333,0.032051,0.030675,8*0.030103,
     K7*0.029960,2*0.042285,15*0.030103,9*0.029960/
      IF (SPL .LT. FL(JJ,1)) GO TO 20
      IF (SPL .GT. 150.0) GO TO 30
      IF (SPL .GE. FL(JJ,1) .AND. SPL .LT. FL(JJ,2)) GO TO 40
      IF (SPL .GE. FL(JJ,2) .AND. SPL .LT. FL(JJ,3)) GO TO 50
      IF (SPL .GE. FL(JJ,3) .AND. SPL .LT. FL(JJ,4)) GO TO 60
      IF (SPL .GE. FL(JJ,4) .AND. SPL .LE. 150.00001) GO TO 70
   20 FNOY=0.0
      RETURN
   30 FNOY=5001.0
      RETURN
   40 FNOY=0.1*10.0**(FM(JJ,1)*(SPL-FL(JJ,1)))
      RETURN
   50 FNOY=10.0**(FM(JJ,2)*(SPL-FL(JJ,3)))
      RETURN
   60 FNOY=10.0**(FM(JJ,3)*(SPL-FL(JJ,3)))
      RETURN
   70 FNOY=10.0**(FM(JJ,4)*(SPL-FL(JJ,5)))
      RETURN
      END
```

```
      SUBROUTINE CPTC(PTC,I,ID)
C  DECK 10 CPTC
C**********************************************************************
C
C  SUBROUTINE CPTC(PTC,I,ID) COMPUTES THE TONE CORRECTION FOR THE
C  I-TH SPECTRUM AS DESCRIBED IN FAR PART 36 SECTION B36.3.
C
C  WHERE.....
C      PTC         - TONE CORRECTION FOR THE I-TH SPECTRUM IN DB
C      I           - INDEX OF ARRAY FSPL--SPECIFIES SPECTRUM USED TO
C                    COMPUTE PTC.
C      ID          - PROGRAM FLAG USED TO IDENTIFY THE SPL DATA FROM WHICH
C                    PTC IS TO BE COMPUTED._
C                    ID=0 -- COMPUTE PTC USING SPLA,
C                    ID=1 -- COMPUTE PTC USING SPLX.
C      SPLA        - ARRAY CONTAINING NORMALIZED SOUND PRESSURE LEVEL DATA
C                    IN DB
C      SPLX        - ARRAY CONTAINING SOUND PRESSURE LEVEL DATA IN DB
C      IPTC        - ARRAY CONTAINING FREQUENCY BAND INDEX OF FSPL VALUE
C                    USED TO COMPUTE TONE CORRECTION. IPTC
C                    IS ONLY REQUIRED FOR THE NORMALIZED DISTANCE.
C                    WITH MINOR CHANGES THIS ARRAY COULD BE DELETED.
C
C  THIS 'OMEGA 10' PROGRAM ASSUMES THAT ALL MEAN SPL(J) DATA POINTS ARE
C  DEFINED. NO CHECK IS MADE IN THIS SUBROUTINE.
C
C**********************************************************************
C
C  NOTE: F(24) TO    S(24) IN BLANK COMMON BELOW CORRESPOND TO PART
C        OF ARRAY PROC(22,7,2) IN THE MAIN DECK.
C
C**********************************************************************
C**********************************************************************
C**                                                                  **
C**        IN THIS SUBROUTINE IBL=17 CORRESPONDS TO IL=1 AND IBH=40  **
C**        CORRESPONDS TO IH=24.  IF THIS IS CHANGED IN THE PROGRAM, **
C**        THIS SUBROUTINE MUST BE CHANGED ACCORDINGLY.              **
C**        PTC IS ONLY COMPUTED FOR BANDS 19 TO 40.                  **
C**        IF IBL AND IBH ARE OUTSIDE THIS RANGE, CHANGES MUST BE    **
C**        MADE IN THIS SUBROUTINE TO LIMIT COMPUTATIONS TO THIS RANGE. **
C**                                                                  **
C**********************************************************************
      DIMENSION ICT(24),SPLP(24),SPL(24)
      COMMON  IL,IH,L,SPLA(6,24),DMYY(60),IPTC(24),SPLX(22,24),DM(2002),
     1F(24),SPLPP(24),SP(25),SA(24),S(24)
      EQUIVALENCE (F(1),ICT(1)), (SPLP(1),SPLPP(1))
      C=0.0
      PTC=0.0
      IPTC(I)=0
      ILL=3
      AMX=-1000.0
      IF (ID) 370,370,395
C  LABELS 370 TO 420 --> DETERMINE THE MAXIMUM SPL VALUE AND THE ARRAY
C  INDEX OF THIS MAXIMUM VALUE:
  370 DO 390 J=ILL,IH
```

```
      SPL(J)=SPLA(I,J)
      IF (SPL(J)-AMX) 390,375,375
  375 IL1=J
      AMX=SPL(J)
  390 CONTINUE
      GO TO 430
  395 DO 420 J=ILL,IH
      SPL(J)=SPLX(I,J)
      IF (SPL(J)-AMX) 420,400,400
  400 IL1=J
      AMX=SPL(J)
  420 CONTINUE
C  LABELS 430 TO 470 --> DETERMINE NUMBER OF CONSECUTIVE BANDS WITH
C  SPL>20 DB ON EACH SIDE OF THE PEAK SPL:
  430 DO 440 J=IL1,IH
      IH1=J
      IF (SPL(J) .LT. 20.0) GO TO 450
  440 CONTINUE
      GO TO 460
  450 IH1=IH1-1
  460 DO 470 J=ILL,IL1
      IL2=IL1-J+ILL
      IF (SPL(IL2) .LT. 20.0) GO TO 480
  470 CONTINUE
      GO TO 490
  480 IL2=IL2+1
C
C  IL2 ---> IH1 IS THE FREQUENCY INDEX OVER WHICH TONE CORRECTION IS
C  COMPUTED.  ALL SPL(J)>20.0 DB OVER THIS RANGE.
C  IF (IH1-IL2-8) < 1, THERE ARE AT MOST NINE GOOD FSPL VALUES IN THE
C  SPECTRUM; THUS PTC=0. IN THIS PROGRAM 10 GOOD BANDS ARE REQUIRED.
C
  490 IF (IH1-IL2-8) 220,220,5
    5 IF (IL2 .LT.  3) IL2=3
C  IL2 AND IH1 ARE THE INDICES OF THE FIRST AND LAST GOOD  SPL VALUE IN
C  THE SPECTRUM.
      S(IL2)=0
      ICT(IL2)=0
C  FROM HERE TO LABEL 40 CORRESPONDS TO STEPS 1, 2 AND 3 IN SECTION
C  B36.3.
      IL3=IL2+1
      IL1= IL3 + 1
      ICT(IL3)=0
      S(IL3)=SPL(IL3)-SPL(IL2)
C  COMPUTE SPL CHANGES (SLOPES) AND SET ICT(J) FLAG.
C  ICT(J)=1 CORRESPONDS TO ENCIRCLED SPL IN 'FAR PART 36'.
      DO 40 J=IL1,IH1
      ICT(J)=0
      S(J)=SPL(J)-SPL(J-1)
   10 IF (ABS(S(J)-S(J-1))-5.0) 40,40,20
   20 IF (S(J) .GT. 0.0 .AND. S(J) .GT. S(J-1)) GO TO 30
      IF (S(J) .LE. 0.0 .AND. S(J-1) .GT. 0.0) ICT(J-1)=1
      GO TO 40
   30 ICT(J)=1
   40 CONTINUE
```

```
C  FROM HERE TO 2 LINES AFTER LABEL 80 CORRESPONDS TO STEPS 4 AND 5
C  IN SECTION B36.3.
      SPLP(IL2)=SPL(IL2)
      DO 80 J=IL3,IH1
      IF (ICT(J)) 50,50,60
   50 SPLP(J)=SPL(J)
      GO TO 80
   60 IF (J .EQ. IH1) GO TO 70
C  FOR FLAGGED SPL, COMPUTE AVERAGE OF SPL BEFORE AND AFTER:
      SPLP(J)=0.5*(SPL(J-1)+SPL(J+1))
      GO TO 80
   70 SPLP(J)=SPL(J-1)+S(J-1)
C  COMPUTE NEW SLOPE (S') -- STEP 5:
   80 SP(J)=SPLP(J)-SPLP(J-1)
      SP(IL2)=SP(IL3)
      SP(IH1+1)=SP(IH1)
C  FROM HERE TO LABEL 210 CORRESPONDS TO STEPS 6 TO 10 IN SECTION B36.3:
C  FIRST SPL''=INITIAL SPL:
      SPLPP(IL2)=SPL(IL2)
      DO 210 J=IL2,IH1
      IF (J-IH1) 90,100,100
C  COMPUTE AVERAGE SLOPE-- STEP 6:
   90 SA(J)=(SP(J)+SP(J+1)+SP(J+2))/3.0
C  ADD AVERAGE SLOPE TO PREVIOUS SPL'' --- STEP 7:
      SPLPP(J+1)=SPLPP(J)+SA(J)
C  F(J) IS THE SOUND PRESSURE LEVEL DIFFERENCE (STEP 8); IF F(J) < 3,
C  TONE CORRECTION IS ZERO.
  100 F(J)=SPL(J)-SPLPP(J)
      IF (F(J)-3.0) 210,110,110
  110 IF (J .GE. 11 .AND. J .LE. 21) GO TO 140
C  DETERMINE  'C' FOR FREQUENCIES 50 TO 400 HZ AND 5300 TO 10000 HZ:
      IF (F(J)-20.0) 120,130,130
  120 C=F(J)/6.0
      GO TO 160
  130 C=3.3333333
      GO TO 160
C  DETERMINE  'C' FOR FREQUENCIES 500 TO 5000 HZ:
  140 IF (F(J)-20.0) 145,150,150
  145 C=F(J)/3.0
      GO TO 160
  150 C=6.6666667
  160 IF (C-PTC) 210,210,170
  170 PTC=C
      IPTC(I)=J
  210 CONTINUE
      RETURN
  220 CONTINUE
      RETURN
      END
```

```
      SUBROUTINE CAL(I,ID)
C     DECK 11  CAL
C*****************************************************************************
C
C     THIS SUBROUTINE COMPUTES THE A-WEIGHTING OVERALL SOUND LEVEL.
C
C     WHERE.....
C        I     - INDEX OF ARRAY FSPL--SPECIFIES SPECTRUM USED TO COMPUTE AL.
C        ID    - IDENTIFIES THE SPL DATA USED TO COMPUTE THE ALA OR ALX DATA
C                ID=0 -- USE SPLA DATA
C                ID=1 -- USE SPLX DATA
C        ALX   - ARRAY CONTAINING THE A-WEIGHTING OVERALL SOUND LEVEL IN DBA
C        ALA   - ARRAY CONTAINING THE A-WEIGHTING OVERALL SOUND LEVEL IN DBA
C                COMPUTED FROM SPLA
C        AW    - ARRAY CONTAINING THE A-WEIGHTING COEFFICIENTS DEFINED
C                ONLY FOR BANDS IBL=17 TO IBH=40
C        SPLX  - ARRAY CONTAINING SOUND PRESSURE LEVEL DATA IN DB
C        SPLA  - ARRAY CONTAINING NORMALIZED SOUND PRESSURE LEVEL DATA IN DB
C
C*****************************************************************************
      DIMENSION AW(24)
      COMMON  IL,IH,L,        SPLA( 6,24),THETA( 6),PNLA( 6),PNLTA( 6),AL
     1A( 6),DMYY(60),    SPLX(22,24),PNLTX(22),PNLX(22),ALTX(22),ALX(22)
      DATA AW/-30.2,-26.2,-22.5,-19.1,-16.1,-13.4,-10.9,-8.6,-6.6,-4.8,
     A-3.2,-1.9,-0.8,0.0,0.6,1.0,1.2,1.3,1.2,1.0,0.5,-0.1,-1.1,-2.5/
      AL=0.0
      IF (ID) 20,20,5
    5 DO 10 J=IL,IH
C     IF (SPLX(I,J) .GT. 9990.0) GO TO 10
      AL=AL+10.0**((SPLX(I,J)+AW(J))/10.0)
   10 CONTINUE
      GO TO 40
   20 DO 25 J=IL,IH
   25 AL=AL+10.0**((SPLA(I,J)+AW(J))/10.0)
   40 IF (AL     .LT. 0.000001) GO TO 45
      AL=      10.0*ALOG10(AL)
      GO TO 50
   45 AL    =9999.0
   50 IF (ID) 60,60,70
   60 ALA(I)=AL
      RETURN
   70 ALX(I)=AL
      RETURN
      END
```

```
      SUBROUTINE OUTH(IRD,IPTC,SENX,IFLG,IPF)
C   DECK 12    OUTH
C*********************************************************************
C
C   SUBROUTINE 'OUTH' PRINTS THE SPL AND SINGLE EVENT NOISE DATA ON
C   PAGES  H, I, L AND M.
C
C   IRD  - INDEX OF THE PROFILE DISTANCE WHICH IS WITHIN 1 % OF THE
C          REFERENCE DISTANCE FOR THIS POWER SETTING.
C   IPTC - FREQUENCY BAND INDEX OF THE SPL VALUE WHICH DETERMINES THE
C          TONE CORRECTION IN THE REFERENCE SPECTRUM.
C   IFLG - PROGRAM FLAG WHICH IS GREATER THAN ZERO WHEN THE POWER SETTING
C          EXTRAPOLATION LIMIT WAS EXCEEDED.
C   NOTE: ARRAY SENX(22,7) IS EQUIVALENT TO ARRAYS
C         PNLTX(22) ---> SELX(22)    IN THE MAIN DECK.
C         (ALSO SEE SUBROUTINE 'CDIST' FOR ADDITIONAL INFORMATION)
C
C         ARRAY SENX(22,7)IS A DUMMY VARIABLE FOR ARRAY PROC(22,7,IPROP)
C         IN THE MAIN DECK.
C
C   IPF=1 OR 2 --- PRINT BOTH 'SPL' AND 'SINGLE EVENT' DATA PAGES (NP=0
C                  AND IPR=1 ONLY).
C   IPF=3 OR 4 --- PRINT 'SINGLE EVENT' PAGE 'I' OR 'M' (IPR=1, NP>0).
C
C*********************************************************************
      DIMENSION FMT1(13),DM(7),ISEQD(7),ISEQF(7),FMT(27),SENX(22,7)
      COMMON IBNL,IBNH,L,DMY(198),NR(5),ISPL(24),
     1 SPLX(22,24)
      COMMON /OUTC/ORD(43),ISC(3),IORD(28),DASH,DOT,X,BLK,DATEN,PP(84,3)
      EQUIVALENCE (FMT(1),FMT1(1)),(FMT(14),DM(1))
      DATA F1/10H(10X,1H(, /, F2/5HI7,3X/,   F3/6H,1H)) /,  FI/6H,I3,1X/
     1, FA/3H,A4/,IBLK/1H /,  FC/7H,I3,1H</
     2, F4/6HI10,7X/,F5/3H,5X/,F6/4H,11X/,F7/8H,5X,1H))/,F9/5H,F9.1/
     3, A9/3H,A9/,ISEQD/4,3,2,1,7,6,5/,ISEQF/3,4,6,7,9,10,12/
C   PRINT HEADING FOR PAGE 'H' OR 'L' --- SPL DATA.
      IF (IPF-2) 10,10,55
   10 FMT(1)=F1
      FMT(2)=F2
      FMT(27)=F3
      CALL HEAD(7)
      WRITE(6,2100)
C   PRINT COLUMN HEADING LINES:
      WRITE(6,2000)  (J,J=17,40)
      WRITE(6,2100)
      DO  50 I=1,22
      IF (I .EQ. 8 .OR. I .EQ. 18) WRITE(6,2100)
      K=I+6
      DO 40 J=IBNL,IBNH
C
C   ALL SPLX(I,J) DATA <0 ARE BLANKED OUT ON PAGES 'H' AND 'L'.
C   IPTC CONTAINS THE FREQUENCY BAND INDEX OF THE SPL VALUE USED TO
C   COMPUTE THE TONE CORRECTION FOR THE I-TH DISTANCE.
C
      IF (SPLX(I,J)) 35,15,15
   15 ISPL(J)=ICV(SPLX(I,J))
```

```
   30 FMT(J+2)=FI
      GO TO 40
   35 FMT(J+2)=FA
      ISPL(J)=IBLK
   40 CONTINUE
C  PRINT TONE CORRECTION FLAG WITH DATA FOR I-TH DISTANCE AND J-TH BAND.
      IF (I-IRD) 45,42,45
   42 J=IPTC
      IF (ISPL(J) .EQ. IBLK) GO TO 45
      IF (J .LT. IBNL .OR. J .GT. IBNH) GO TO 45
      FMT(J+2)=FC
C  PRINT 'SPL' DATA:
   45 WRITE(6,FMT)    IORD(K),ISPL
   50 CONTINUE
      WRITE(6,2100)
      WRITE(6,2150)
      WRITE(6,2200)
      WRITE(6,2300)
C  PRINT HEADING FOR PAGE 'I' OR 'M' --- SINGLE EVENT MEASURE DATA:
   55 CALL HEAD(8)
      WRITE(6,2100)
      WRITE(6,3000)
      WRITE(6,2100)
      FMT1(1)=F1
      FMT1(2)=F4
      FMT1(5)=F5
      FMT1(8)=F6
      FMT1(11)=F5
      FMT1(13)=F7
C  SET UP AND PRINT DATA FOR EACH DISTANCE:
      DO 100 I=1,22
      IF (I .EQ. 6 .OR. I .EQ. 18) WRITE(6,2100)
      K=I+6
      DO 80 J=1,7
C  JD -- INDEX OF DATA IN ARRAY 'SENX' (PRINT SEQUENCE IS: AL, ALT,
C  PNL, PNLT, SEL, SELT, AND EPNL):
      IF (IPF-2) 550,550,560
  550 JD=ISEQD(J)
      GO TO 570
  560 JD=8-J
C  JF -- VARIABLE FORMAT INDEX CORRESPONDING TO THE JD-TH VARIALE:
  570 JF=ISEQF(J)
      IF (SENX(I,JD)) 70,75,75
   70 DM(J)=BLK
      FMT1(JF)=A9
      GO TO 80
   75 DM(J)=SENX(I,JD)
      FMT1(JF)=F9
   80 CONTINUE
C  PRINT DATA LINE:
      WRITE(6,FMT1) IORD(K),DM
  100 CONTINUE
      WRITE(6,2100)
      WRITE(6,2150)
      WRITE(6,2200)
```

```
      WRITE(6,2250)
      IF (LFLG .GT. 0) WRITE(6,2400)
      RETURN
C*********************************************************************
C*********************************************************************
 2000 FORMAT( 10X, 9H(   SLANT, 39X, 21HFREQUENCY BAND NUMBER, 38X,1H)/
     1 10X,10H( DISTANCE, 24I4,2H )/ 10X,9H(   (FEET), 96X,1H))
 2100 FORMAT( 10X, 1H(, 106X,1H))
 2150 FORMAT( 10X, 1H(, 106(1H-),1H))
 2200 FORMAT(12X,  50H* EXTRAPOLATED FROM MEAN VALUES FOR LEVEL FLIGHTS.
     1)
 2250 FORMAT(12X,  46H** BASED ON SMOOTHED TONE CORRECTION FUNCTION.)
 2300 FORMAT(12X,48H< BAND WHICH DETERMINES THE TONE CORRECTION (C). )
 2400 FORMAT(12X,*NOTE: POWER SETTING EXTRAPOLATION LIMITED BY AMRL/BBE,
     1 W-PAFB.*)
 3000 FORMAT( 10X, 16H( SLANT DISTANCE,  8X,2HAL,6X,5HALT**, 9X,3HPNL,
     1  5X,6HPNLT**,16X, 3HSEL, 5X, 6HSELT**, 8X, 10HEPNL**    )/
     2  10X,1H(, 5X, 6H(FEET), 5X, 2(4X,5H(DBA)), 5X,2(3X,6H(PNDB)),11X,
     3  2(5X,4H(DB)), 8X, 12H(EPNDB)     ))
C*********************************************************************
C*********************************************************************
      END
```

```
      SUBROUTINE OUTJ(IP,SENX,LFLG)
C     DECK 13  OUTJ     (PRINTS PAGES J, K, N AND O)
C*********************************************************************
C
C     SUBROUTINE 'OUTJ' PRINTS TAB PLOTS OF SINGLE EVENT NOISE DATA
C     ON PAGES J, K, N AND O.
C
C     NOTE: ARRAY SENX(22,7) IS EQUIVALENT TO ARRAYS PNLTX(22) --->
C           SELX(22)  IN SUBROUTINE 'CDIST' AND IN THE MAIN DECK
C           (IP=1 AND 2).
C
C           SENX(22,7) IS A DUMMY VARIABLE EQUIVALENT TO PROC(22,7,IPROP)
C           IN THE 'MAIN' DECK (IP=3 AND 4). THE SEQUENCE OF DATA HERE IS
C           EPNLX, SELTX, SELX, PNLTX, PNLX, ALTX AND ALX.
C
C           PLOT ARRAY, PP(84,3), IS DEFINED IN SUBROUTINE 'IPA'.
C
C     IP=1 --- PLOT PNLTX, PNLX, ALTX, AND ALX DATA AT REFERENCE FILE
C              POWER SETTING AND AIRSPEED (FOR NP=0 AND IPR=1 ONLY).
C     IP=2 --- PLOT EPNLX, SELTX, AND SELX DATA AT REFERENCE FILE POWER
C              SETTING AND AIRSPEED (FOR NP=0 AND IPR=1 ONLY).
C     IP=3 --- PLOT EPNLX, SELTX, AND SELX DATA AT REQUESTED POWER
C              SETTING AND AIRSPEED (IPR=1 ONLY).
C     IP=4 --- PLOT PNLTX, PNLX, ALTX, AND ALX DATA AT THE REQUESTED
C              POWER SETTING AND AIRSPEED (IPR=1 ONLY).
C     IFLG - PROGRAM FLAG WHICH IS GREATER THAN ZERO WHEN THE POWER SETTING
C            EXTRAPOLATION LIMIT WAS EXCEEDED.
C
C*********************************************************************
      DIMENSION PG(4),TITLE(2,2),SYM(7),VAR(7),PB(83),PD(83),IX(4),
     1 SAVE(4),PM(83),SENX(22,7),PAG(12)
      COMMON IBNL,IBNH,L,DMY(199),NR(6),ISRC(24),
     1 SPLX(22,24)
      COMMON /COMPC/IV(6),IMS(6),P(2,6),OPC(6),OPCC(12),PS(2,6),PSC(12),
     1 PSU,PSIF(6),PSCF(12),IREQC(3,12),VX(12),SX(22),ATNC(24),ATNR(24),
     2 DELN,IPTC,IPROP,MEAS(3),OPCR(12),PC(2,12)
      COMMON /HEADC/ AC,DATE,ACC,IPAGE,IVX,ITEMP,IRHUM,IVER,PV,CRI,
     1 ET(2),OTC
      COMMON /OUTC/ORD(43),ISC(9),IORD(28),DASH,DOT,X,BLK,DATEN,PP(84,3)
      EQUIVALENCE (PP(2,1),PB(1)),(PP(2,2),PD(1)),(PP(2,3),PM(1))
      DATA PG/1HJ,1HK,1HN,1HO/
      DATA TITLE/10H  AIR TO G, 6HROUND , 10HGROUND TO , 6HGROUND/
      DATA SYM/1HP,1H*,1H+,1HA,1HE,1HT,1HS/,  VAR/7H = PNLT,5H = PNL,
     1 6H = ALT, 5H = AL, 7H = EPNL, 7H = SELT,7H = SEL /
     2,PAG/1H1,1H2,1H3,1H4,1H5,1H6,1H7,1H8,1H9,2H10,2H11,2H12/
C     JS --- SYMBOL ARRAY ADJUSTMENT FACTOR FOR IP=3 PLOT:
      JS=0
      IPP=2*IPROP
      IF (IP .EQ. 1 .OR. IP .EQ. 4) IPP=IPP-1
C     PRINT 'ID' BLOCK IN UPPER RIGHT CORNER OF EACH PAGE:
      WRITE(6,2000) IVER,ACC,OTC, OPCC(L),PV,DATE,PG(IPP),PAG(IPAGE)
      GO TO (10,20,25,28),IP
   10 J1=1
      J2=4
      GO TO 30
```

```
   20 J1=5
      J2=7
      GO TO 30
   25 J1=1
      J2=3
      JS=4
      GO TO 30
   26 J1=4
      J2=7
      JS=-3
   30 AMX=-1000.0
C  DETERMINE MAXIMUM VALUE FROM THE FIRST 10 DISTANCES.
      DO 40 I=1,10
      DO 40 J=J1,J2
      IF (SENX(I,J) .GT. 9990.0) GO TO 40
      AMX=AMAX1(AMX,SENX(I,J))
   40 CONTINUE
      MX=((ICV(AMX)+8)/10)*10
C  COMPUTE ABSCISSA SCALE (ISC):
      DO 50 I=1,9
      J=10-I
   50 ISC(J)=MX-10*I+10
      MX=MX+1
      MN=ISC(1)-1
      IDST=0
      LINE=0
C  SET UP AND PRINT PLOT LINE FOR EACH DISTANCE:
      DO 400 I=1,22
C  M IS THE 'IORD' ORDINATE ARRAY INDEX:
      M=I+6
      K=0
      LINE=LINE+1
      IDST=IDST+1
C  IDST IS USED TO SET UP THE GRID PATTERN WHICH REPEATS EVERY 10
C  DISTANCES
C  LG=1 ---> PRINTS 5 DOTS PER INCH ON TAB PLOT.
C  LG=2 ---> PRINTS 1 DOT  PER INCH ON TAB PLOT.
C  LG=3 ---> PRINTS 10 DASHES PER INCH ON THE TAB PLOT.
      GO TO (60,70,85,85,75,85,85,75,85,80),IDST
   60 IF (I-1) 65,65,75
   65 LG=3
      GO TO 90
   70 IF (I-22) 85,65,65
   75 LG=2
      GO TO 90
   80 IDST=0
   85 LG=1
C  SET UP PLOT ARRAY (PP):
   90 DO 150 J=J1,J2
      II=ICV(SENX(I,J))-MN+2
      IF (II .LT. 2 .OR. II .GT. 84) GO TO 150
      IF (PP(II,LG) .EQ. BLK .OR. PP(II,LG) .EQ. DOT) GO TO 110
      IF (PP(II,LG) .EQ. DASH) GO TO 110
      PP(II,LG)=X
      GO TO 150
```

```
  110 K=K+1
      IX(K)=II
      SAVE(K)=PP(II,LG)
      PP(II,LG)=SYM(J+JS)
  150 CONTINUE
C  FIRST 8 LINES CONTAIN 'ID' BLOCK IN UPPER LEFT CORNER:
      IF (LINE-9) 220,200,155
C  LINES 36 TO 40 CONTAIN THE SYMBOL LEGEND IN THE LOWER RIGHT CORNER:
  155 IF (LINE-35) 200,270,260
  200 WRITE(6,2600) ORD(LINE),IORD(M),(PP(J,LG),J=2,64)
  210 LINE=LINE+1
      WRITE(6,3000) ORD(LINE)
      GO TO 320
C  LABEL 220 TO 245 -- PRINT ID BLOCK IN UPPER LEFT CORNER PLUS THE PLOT
C                      LINES TO THE RIGHT OF THE ID BLOCK.
  220 GO TO (230,235,240,245),IDST
  230 WRITE(6,2600) ORD(LINE),IORD(M),(PP(J,LG),J=2,84)
      WRITE(6,3060) AC,PC(1,L),PC(2,L)
      GO TO 300
  235 WRITE(6,2640)IORD(M),PSC(L),PSU,(PB(J),J=45,83)
      WRITE(6,3030) IVX
      GO TO 300
  240 WRITE(6,2620) IORD(M),ITEMP,IRHUM,(PB(J),J=36,83)
      WRITE(6,3040)  DELN
      GO TO 300
  245 WRITE(6,2630) IORD(M),(PB(J),J=36,83)
      WRITE(6,3050) IVER,ACL,OTC, OPCC(L),DATEN,PV
      GO TO 300
C  LABEL 260 TO 290 -- PRINT LEGEND IN LOWER RIGHT CORNER PLUS PLOT
C                      LINES TO THE LEFT OF THE LEGEND.
  260 II=(LINE-35)/2
      GO TO (280,275,200,290),II
  270 WRITE(6,2600) ORD(LINE),IORD(M),PD
      JJ=J1+JS
      WRITE(6,3010) TITLE(1,IPROP),TITLE(2,IPROP)
      GO TO 300
  275 JJ=JJ+1
  280 WRITE(6,2610) IORD(M),(PB(J),J=1,63),SYM(JJ),VAR(JJ),(PB(J),J=80,8
     13)
      JJ=JJ+1
      IF (JJ-J2-JS) 285,285,210
  285 WRITE(6,3020) SYM(JJ),VAR(JJ)
      GO TO 300
  290 WRITE(6,2600) ORD(LINE),IORD(M),PM
      GO TO 320
  300 LINE=LINE+1
  320 IF (K) 400,400,330
C  RECONSTRUCT PLOT ARRAY (PP):
  330 DO 350 J=1,K
      II=IX(J)
  350 PP(II,LG)=SAVE(J)
  400 CONTINUE
C  PRINT ABSCISSA SCALE AND TITLE:
      WRITE(6,2200) ISC
      IF (LFLG .GT. 0) WRITE(6,2400)
```

```
      RETURN
2000 FORMAT(1H1/120X9HOMEGA 10.,I1//120X,10HA/C CODE: ,A3/  120X,10HOPS
    1 CODE: ,A1,A2/ 120X,13HPROFILE VER: ,A1/
    2 120X,6HDATE: ,A10/ 120X,6HPAGE  ,A1,A2//)
2200 FORMAT(14X, 9I10/ 54X,17HNOISE LEVEL IN DB )
2400 FORMAT(/15X,*NOTE: POWER SETTING EXTRAPOLATION LIMITED BY AMRL/BBE
    1, W-PAFB.*)
2600 FORMAT(13X,A1,I5,2H (,63A1,1H))
2610 FORMAT(14X,I5,2H (, 63A1, 4X,A1,A7,4X,4A1,1H))
2620 FORMAT(14X,I5,  12H ( .  TEMP =,I3,  17H F    REL HUMID =,I3,2H %,
    1  48A1,1H))
2630 FORMAT(14X,I5,  4H ( .   ,33X,48A1,1H))
2640 FORMAT(14X,I5,4H ( .,2X,A5,1X,A6,28X,39A1,1H))
3000 FORMAT(13X,A1,6X,1H(,63X,1H))
3010 FORMAT(20X,1H(,63X,A10,A6,4X,1H))
3020 FORMAT(20X,1H(,67X,A1,A7,6X,1H))
3030 FORMAT(20X, 15H(     AIRSPEED =,I4, 6H KNOTS, 59X,1H))
3040 FORMAT(20X, 15H(     DELTA N  =,F5.1,3H DB,61X,1H))
3050 FORMAT(20X,15H(    IDENT: 10.,I1,1H-,A3,1H-,A1,A2,1H-, A6, 1H-,A1
    1,51X,1H))
3060 FORMAT(20X,1H(,4X,A10,3X,2A10,45X,1H))
      END
```

```
      SUBROUTINE PPFDAT(PRDC,LFLG,COMD,IJ)
C  DECK 14  PPFDAT
C*****************************************************************
C
C   SUBROUTINE 'PPFDAT' WRITES THE EPNLX, SELX AND SELTX PROFILE DATASETS
C   INCLUDING COMDECK AND COMMENT CARDS ON FILE 'TAPE3'.
C
C   NOTE: ARRAY PRDC(22,7,2) CONTAINS THE EPNLX, SELTX, SELX, PNLTX,
C         PNLX, ALTX, AND ALX DATA (PNLTX --> ALX DATA NOT PUNCHED)
C         FOR 22 DISTANCES FOR AIR-TO-GROUND (PRDC(22,7,1)) AND FOR
C         GROUND-TO-GROUND (PRDC(22,7,2)).
C
C   LFLG - PROGRAM FLAG WHICH IS GREATER THAN ZERO WHEN THE POWER
C          SETTING EXTRAPOLATION LIMIT WAS EXCEEDED.
C   COMD - LAST FIVE CHARACTERS OF EACH REFERENCE FILE COMDECK NAME FOR
C          THE L-TH POWER SETTING.
C   IJ   - SEE COMMENTS IN THE SOURCE LISTING BELOW.
C
C*****************************************************************
      DIMENSION DKEY(3),CKEY(3),PRDC(22,7,2),REF(4),COMD(6)
      COMMON IBNL,IBNH,L
      COMMON /COMPC/IV(6),IMS(6),P(2,6),OPC(6),OPCC(12),PS(2,6),PSC(12),
     1 PSU,PSIF(6),PSCF(12),IREQC(3,12),VX(12),SX(22),ATNC(24),ATNR(24),
     2 DELN,IPTC,IPROP,MEAS(3),OPCR(12),PC(2,12)
      COMMON /HEADC/ AC,DATE,ACC,IPAGE,IVX,ITEMP,IRHUM,IVER,PV,CRI,
     1 ET(2),OTC
      DATA DKEY/4HEPNL,4HSELT,4HSEL /,CKEY/1HE,1HS,1HL/,RN/1HN/
     1,BLK/1H /
C   IMSR --- REFERENCE DISTANCE IN FEET WHICH IS ASSUMED TO BE 1000 FEET
C   FORMERLY PRINTED ON THE FIRST 'COMMENT' CARD.
C
C   'IJ' CONTAINS THE INDEX OF THE THIRD REFERENCE DATASET (FOR 2-ND
C   SLOPE LINE)   REQUIRED WHEN THE REQUESTED (PSC) AND REFERENCE
C   POWER SETTINGS ARE ON OPPOSITE SIDES OF THE APPROACH POWER.
C
C   IREQC(3,12) CONTAINS INDICES OF REFERENCE DATA USED TO COMPUTE
C   THE PROFILE DATASET -- REFERENCE POINT PLUS SLOPE POINTS
C   DEFINED IN SUBROUTINE 'DELTAS'.  HERE TO LABEL 18 --> SET UP ARRAY
C   'REF' FOR PRINTING THE REFERENCE AND SLOPE 'COMDECK' NAMES (PART
C   IN 'REF') REQUIRED TO COMPUTE THE PROFILE DATA FOR THE L-TH POWER
C   SETTING (PRINTED ON THE SECOND 'COMMENT' CARD BELOW):
      ID=IREQC(3,L)
      IC=IREQC(1,L)
      J=IREQC(2,L)
      IF (ID) 5,10,15
    5 ID=IABS(ID)
      GO TO 15
   10 II=1
      REF(1)=COMD(IC)
      GO TO 18
   15 II=3
      REF(1)=COMD(IJ)
      REF(2)=COMD(IC)
      REF(3)=COMD(J)
      IF (IJ) 16,18,17
```

```
   17 II=4
      REF(4)=COMD(IJ)
   16 DO 100 J=1,3
      IF (MEAS(J)) 100,100,20
C  PRINT 'COMDECK' LINE:
   20 WRITE(3,2100) CKEY(J),ACC, OPCC(L),OTC,PV,CRI
      ID=2
      IC=1
C  PRINT FIRST DATA LINE:
      WRITE(3,2000) DKEY(J),ACC,OPCC(L),OTC,ID,(PRDC(I,J,1),I=1,6),AC,IC
C  PRINT THREE OR FOUR 'COMMENT' LINES:
      WRITE(3,2110) ACC,OPCC(L),OTC,PV,CRI,IVER,DATE,AC,   IVX,ITEMP
     1,IRHUM
      WRITE(3,2120) ACC,OPCC(L),OTC,PV,CRI,ET,(RN,ACC,REF(I),I=1,II)
      WRITE(3,2130) ACC,OPCC(L),OTC,PV,CRI,PC(1,L),PC(2,L),PSC(L),PSU
C  PRINT FOURTH 'COMMENT' WHEN LFLG>0 --- EXTRAPOLATION LIMIT EXCEEDED:
      IF (LFLG .GT. 0) WRITE(3,2140) ACC,OPCC(L),OTC,PV,CRI
      IC=2
C  PRINT REMAINING FIVE DATA LINES:
      WRITE(3,2010) (PRDC(I,J,1),I=7,14),AC,IC
      IC=3
      WRITE(3,2010) (PRDC(I,J,1), =15,22),AC,IC
      ID=1
      IC=4
C  WRITE THE THREE GROUND-TO-GROUND DATA CARDS:
      WRITE(3,2000)      BLK,ACC,OPCC(L),OTC,ID,(PRDC(I,J,2),I=1,6),AC,IC
      IC=5
      WRITE(3,2010) (PRDC(I,J,2),I=7,14),AC,IC
      WRITE(3,2010) (PRDC(I,J,2),I=15,22),AC
  100 CONTINUE
      RETURN
 2000 FORMAT(A6,2X,A3,A2,A1,7X,I1,6F8.1,A7,2X,I1)
 2010 FORMAT(6X,8F8.1,A7,2X,I1)
 2100 FORMAT(9H*COMDECK ,A1,A3,A2,3A1)
 2110 FORMAT(8HCOMMENT ,A3,A2,3A1, 9H OMEGA10.,I1,1X,A10,A7,10X,
     1I3,6H KTS  ,I3,4H F  ,I3,4H PCT)
 2120 FORMAT(8HCOMMENT ,A3,A2,3A1,1X,A10,A5,1X,4(1X,A1,A3,A5))
 2130 FORMAT(8HCOMMENT ,A3,A2,3A1,1X,2A10,3(1X,A5,1X,A6,1X))
 2140 FORMAT(8HCOMMENT ,A3,A2,3A1,* POWER SETTING EXTRAPOLATION LIMITED
     1BY AMRL/BBE, W-PAFB.*)
      END
```

```
      SUBROUTINE TITPG(IPR)
C  DECK 15   PRINT TITLE PAGE
C***********************************************************************
C
C  THIS SUBROUTINE IS CALLED FROM THE 'MAIN' ROUTINE TO PRINT THE TITLE
C  (COVER) PAGE WHEN PRINT PARAMETER 'IPR' > 0.
C
C***********************************************************************
      DIMENSION PG(6)
      COMMON /HEADC/ AC,DATE,ACC,IPAGE,IVX,ITEMP,IRHUM,IVER,PV,CRI,
     1 ET(2),OTC
      DATA PG/1HM,5HI,J,K,1HL,5HM,N,O,5H I,K ,5H M,O /
      DATA FLY/8HFLYOVER /
C
      WRITE(6,3000)
C  PRINT TOP BORDER LINES:
      WRITE(6,3010)
      DO 700 I=1,3
  700 WRITE(6,3030) AC,AC,AC,AC,AC
      DO 720 I=1,11
  720 WRITE(6,3020)
      WRITE(6,3035)
      WRITE(6,3020)
C  PRINT AIRCRAFT NAME:
      WRITE(6,3040) AC
      WRITE(6,3020)
      WRITE(6,3045)
      WRITE(6,3020)
      WRITE(6,3020)
      WRITE(6,3020)
C  PRINT ADDITIONAL TEST ID INFORMATION:
      WRITE(6,3050) FLY
  740 WRITE(6,3055) ACC
      WRITE(6,3070) PV
      WRITE(6,3060) IVER
C  FROM HERE TO LABEL 755 -- PRINT TABLE OF CONTENTS:
      WRITE(6,3100)
      WRITE(6,3120)
      WRITE(6,3130)
      IF (IPR-1) 745,745,750
  745 WRITE(6,3145) PG(5)
      WRITE(6,3150)
      WRITE(6,3145) PG(6)
      GO TO 755
  750 WRITE(6,3140) PG(1)
      WRITE(6,3145) PG(2)
      WRITE(6,3150)
      WRITE(6,3140) PG(3)
      WRITE(6,3145) PG(4)
  755 DO 760 I=1,8
  760 WRITE(6,3020)
  765 WRITE(6,3155) DATE
      WRITE(6,3020)
      WRITE(6,3020)
      WRITE(6,3160)
```

```
      DO 770 I=1,4
  770 WRITE(6,3020)
C  PRINT BOTTOM BORDER LINES:
      DO 780 I=1,3
  780 WRITE(6,3030) AC,AC,AC,AC,AC
      WRITE(6,3010)
C
 3000 FORMAT(1H1)
 3010 FORMAT( 1X,33(4HUSAF))
 3020 FORMAT( 1X,4HUSAF,124X,4HUSAF)
 3030 FORMAT( 1X,4HUSAF,6X,4(A10,10H  AIRCRAFT,7X),A10,4HUSAF)
 3035 FORMAT( 1X,4HUSAF,47X,31HNOISE PRODUCED ON THE GROUND BY,46X,
     1 4HUSAF)
 3040 FORMAT( 1X,4HUSAF,53X,A10,9H AIRCRAFT ,52X,4HUSAF)
 3045 FORMAT( 1X,4HUSAF,50X,24HDURING FLIGHT OPERATIONS,50X,4HUSAF)
 3050 FORMAT( 1X,4HUSAF,52X,     A8,13H MEASUREMENTS,51X,4HUSAF)
 3055 FORMAT( 1X,4HUSAF,52X,14HAIRCRAFT CODE:,4X,A3,51X,4HUSAF)
 3060 FORMAT( 1X,4HUSAF,49X,26HCOMPUTER PROGRAM OMEGA 10.,I1,48X,4HUSAF)
 3070 FORMAT(1X,4HUSAF,52X,16HPROFILE VERSION:,4X,A1,51X,4HUSAF)
 3100 FORMAT( 1X,4HUSAF,97X,4HPAGE,23X,4HUSAF)
 3120 FORMAT( 1X,4HUSAF,23X,
     1 24HNORMALIZED SPL SPECTRUM ,51(1H.), 1HG,25X,4HUSAF)
 3130 FORMAT( 1X,4HUSAF,23X, 58HNOISE LEVELS AS A FUNCTION OF SLANT DIST
     1ANCE FROM AIRCRAFT  ,43X,4HUSAF/  1X,4HUSAF,29X,25HAIR-TO-GROUND P
     2ROPAGATION ,70X,4HUSAF)
 3140 FORMAT( 1X,4HUSAF,35X, 29HSOUND PRESSURE LEVEL SPECTRA , 34(1H.),
     1  A1,25X,4HUSAF)
 3145 FORMAT(              1X,4HUSAF,35X, 22HSINGLE EVENT MEASURES ,39(1H.
     2),       A5,23X,4HUSAF)
 3150 FORMAT( 1X,4HUSAF,29X, 26HGROUND-TO-GROUND PROPAGATION,57X,4HUSAF)
 3155 FORMAT( 1X,4HUSAF,56X,A10,55X,4HUSAF)
 3160 FORMAT( 1X,4HUSAF,25X,73HA E R O S P A C E   M E D I C A L   R E S
     1 E A R C H   L A B O R A T O R Y, 26X,4HUSAF/   1X,4HUSAF,25X,
     2 73HW R I G H T - P A T T E R S O N   A I R   F O R C E   B A S E
     3,   O H I O, 26X,4HUSAF)
C
      RETURN
      END
```

```
      SUBROUTINE SETUPD6(IREQ,N,NP,ACC,ITP,IAP,IHP)
C     DECK 16  SETUPD6
C*********************************************************************
C*********************************************************************
C
C     THIS SUBROUTINE APPLIES THE 'DELTA-6' RULES TO DETERMINE THE
C     REFERENCE DATA REQUIRED TO COMPUTE THE PROFILE DATA AT THE REQUESTED
C     OUTPUT POWER SETTING AND AIRSPEED.  THE ARRAY INDICIES OF THE
C     REQUIRED REFERENCE FILE DATA ARE STORED IN ARRAY IREQC(3,6) WHERE
C     IREQC(1,J) AND IREQC(2,J) ARE INDICIES OF MEASURE AND POWER SETTING
C     DATA USED TO COMPUTE SLOPES AND IREQC(3,J) IS THE INDEX OF THE BASE
C     POINT IN THE LINEAR EQUATION, ALL FOR THE JTH OUTPUT POWER SETTING
C     (OR OPCC).
C     IF ALL IREQC(I,J) FOR I=1,3 ARE ZERO, THE JTH OPCC DATA ARE NOT
C     COMPUTED.  IF IREQC(3,J)<0, MEASURE (SEL, SELT OR EPNL) DATA MUST BE
C     CHECKED (AT 1000 FEET ONLY) TO DETERMINE IF MEASURE DATA AT THE
C     HIGHEST RANKING POWER SETTING ARE GREATER THAN THE MEASURE DATA
C     FOR APPROACH POWER; IF GREATER NO CORRECTION WILL BE MADE AND THE
C     ABSOLUTE VALUE OF IREQC(3,J) CONTAINS THE REFERENCE FILE INDEX OF THE
C     REQUIRED MEASURE DATA.
C     IF IREQC(3,J)=0 AND IREQC(1,J)>0, NO CORRECTION WILL BE MADE AND
C     IREQC(1,J) CONTAINS THE REFERENCE FILE INDEX OF THE REQUIRED MEASURE
C     DATA.
C
C     N     --- NUMBER OF INPUT OPC'S.
C     NP    --- NUMBER OF OUTPUT OPCC'S.
C     IV    --- REFERENCE AIRSPEED FOR JTH OPC.
C     IVX   --- OUTPUT AIRSPEED FOR ITH OPCC (INTEGER VALUE).
C     VX    --- ARRAY CONTAINING OUTPUT AIRSPEED IN KNOTS.
C     OPP   --- ARRAY OF OPERATION POWER CODE DATA FOR ALL DEFINED OPC'S.
C     NOPC  --- NUMBER OF OPERATION POWER CODES IN ARRAY OPP.
C     OPC   --- ARRAY OF INPUT OPERATION POWER CODES FROM REFERENCE FILE.
C     OPCC  --- ARRAY OF OUTPUT OPERATION POWER CODES REQUESTED FOR THIS
C               AIRCRAFT RUN.
C     OPCR  --- ARRAY OF OPERATION POWER CODES (ONE FOR EACH OPCC) WHICH
C               IDENTIFY THE REFERENCE DATA FROM WHICH THE CORRESPONDING
C               OPCC DATA ARE COMPUTED AND THE OPERATION POWER DESCRIPTION
C               DEFINED.
C     PS    --- INPUT POWER SETTING FOR EACH OPC (ARRAY).
C     PSIF  --- INPUT POWER SETTING FOR EACH OPC (ARRAY--FLOATING POINT).
C     PSC   --- OUTPUT POWER SETTING FOR EACH OPCC (ARRAY).
C     PSCF  --- OUTPUT POWER SETTING FOR EACH OPCC (ARRAY--FLOATING POINT).
C     RANK  --- ARRAY GIVING THE RANK OF 5 POWER SETTINGS; USED TO RANK
C               POWER SETTINGS LESS THAN APPROACH POWER.
C     IREQ  --- FLAG ARRAY; IREQ=1 WHEN REFERENCE DATA ARE REQUIRED FOR
C               JTH OPC.
C     IREQC -- SEE ABOVE OR SUBROUTINE 'DELTA6'.
C     ITP   --- INDEX OF REFERENCE TAKEOFF OPC.
C     IAP   --- INDEX OF REFERENCE APPROACH OPC.
C     IHP   --- INDEX OF HIGHEST RANKING OPC WITH POWER SETTING LESS THAN
C               POWER SETTING AT APPROACH.
C
C     ITAHC -- FLAG EVALUATED AS FOLLOWS:
C           ITAHC=1 --- ITP, IAP AND IHP=0 OR AT MOST ONE OF THE THREE =1.
C           ITAHC=2 --- ITP AND IAP=1.
```

```
C        ITAHC=3 --- IAP AND IHP=1.
C        ITAHC=4 --- ITP, IAP AND IHP=1.
C
C**********************************************************************
C**********************************************************************
      DIMENSION    OPP(20),RANK(4),IREQ(6)
      COMMON /COMPC/IV(6),IMS(5),P(2,6),OPC(6),OPCC(12),PS(2,6),PSC(12),
     1 PSU,PSIF(6),PSCF(12),IREQC(3,12),VX(12),SX(22),ATNC(24),ATNR(24),
     2 DELN,IPTC,IPROP,MEAS(3),OPCR(12),PC(2,12)
      DATA  RANK/2H13,2H06,2H04,2H07/,MOPC/20/
     1, OPP/2H  ,2H01,2H02,2H03,2H04,2H05,2H06,2H07,2H08,2H09,2H10,2H11,
     2 2H12,2H13,2H14,2H15,2H16,2H17,2H18,2H19/
C  INITIALIZE SUBROUTINE PARAMETERS:
      ITP=0
      IAP=0
      IHP=0
      IRK=100
      ITAHC=1
      DO 10 J=1,12
      IREQC(1,J)=0
      IREQC(2,J)=0
   10 IREQC(3,J)=0
      IF (NP .LT. 1) GO TO 500
C  CONVERT POWER SETTING DATA FROM 'A' FORMAT TO FLOATING POINT FORMAT
C  (FOR INPUT AND OUTPUT POWER SETTINGS).
      DO 15 I=1,N
      IREQ(I)=0
   15 DECODE(5,3000,PS(1,I)) PSIF(I)
      DO 20 I=1,NP
   20 DECODE(5,3000,PSC(I)) PSCF(I)
C  HERE TO LABEL 70:  EVALUATE ITP, IAP AND IHP:
      DO 30 J=1,N
C  OPP(4)---TAKEOFF POWER:
      IF (OPC(J) .EQ. OPP(4)) GO TO 40
   30 CONTINUE
      DO 35 J=1,N
C OPP(12)---MAX RATED THRUST;  OPP(15)---INTERMEDIATE POWER (MIL):
      IF (OPC(J) .EQ. OPP(12) .OR. OPC(J) .EQ. OPP(15)) GO TO 40
   35 CONTINUE
      GO TO 45
C  ITP= INDEX OF INPUT TAKEOFF POWER OPC OR OPC=11 OR 14:
   40 ITP=J
   45 DO 50 J=1,N
C  APPROACH POWER---OPP(6):
      IF (OPC(J) .EQ. OPP(6)) GO TO 55
   50 CONTINUE
      GO TO 90
C  IAP= INDEX OF INPUT APPROACH POWER:
   55 IAP=J
      DO 70 J=1,N
      IF (PSIF(J) .GE. PSIF(IAP)) GO TO 70
      DO 60 IK=1,5
      IF (OPC(J) .EQ. RANK(IK)) GO TO 65
   60 CONTINUE
      GO TO 70
```

```
   65 IF (IK .GT. IRK) GO TO 70
      IRK=IK
C  IHP= INDEX OF HIGHEST RANKING OPC WITH POWER SETTING < POWER
C        SETTING AT APPROACH:
      IHP=J
   70 CONTINUE
C  ASSUME IAP>0 HERE:
C  SET FLAG ITAHC:
      IF (ITP .GT. 0) ITAHC=2
      IF (IHP .GT. 0) ITAHC=3
      IF (ITP .GT. 0 .AND. IHP .GT. 0) ITAHC=4
C  LABEL 400 LOOP:  ITERATE FOR EACH OUTPUT OPCC(I):
   90 DO 400 I=1,NP
      DO 95 J=1,N
      IF (OPCR(I) .EQ. OPC(J)) GO TO 130
   95 CONTINUE
C  ERROR--OUTPUT OPCC CANNOT BE COMPUTED BECAUSE OPCR IS NOT IN THE
C          REFERENCE FILE.
      GO TO 365
  115 IREQC(3,I)=-J
  118 IREQ(IAP)=1
      IREQ(ITP)=1
      IREQC(1,I)=IAP
      IREQC(2,I)=ITP
      GO TO 400
C  FLAG INPUT AS REQUIRED DATA:
  130 IREQ(J)=1
C  DEFINE OUTPUT OPERATION POWER DESCRIPTION FROM OPCR(I)=OPC(J):
      PC(1,I)=P(1,J)
      PC(2,I)=P(2,J)
C  ASSUME PSIF=PSCF AND THUS NO DELTA"6 ADJUSTMENT (GO TO 360):
      IF (ABS((PSIF(J)-PSCF(I))/PSIF(J)) .LT. 0.001) GO TO 360
      DO 135 II=2,MOPC
C  LABEL 375 BELOW APPLIES TO ERROR FOR OPC=01,02,08,09,10,17,18, OR 19:
C  ERROR-- OMIT OPCC(I) BECAUSE REQUESTED PSCF(I) NOT EQUAL PSIF(J):
      IF (OPCR(I) .EQ. OPP(II)) GO TO (375,375,160,325,180,325,325,
     1 375,375,375,160,230,325,160,260,300,375,375,375),II-1
  135 CONTINUE
C  OPCR(I)=OPC(J)=03 OR 11 OR 14 --- TAKEOFF:
  160 IF (IAP .GT. 0) GO TO 170
C  ERROR-- NO APPROACH DATA AVAILABLE FOR INTERPOLATION OF OPC=03:
      GO TO 370
  170 IREQ(IAP)=1
  175 IREQC(1,I)=IAP
      IREQC(2,I)=ITP
      IREQC(3,I)=J
      GO TO 400
C  OPCR(I)=OPC(J)=05 --- APPROACH POWER:
  180 GO TO (370,185,190,200),ITAHC
C  LABEL 370:
C  ERROR-- NO TAKEOFF  DATA AVAILABLE FOR INTERPOLATION OF OPC=05:
  185 IREQ(ITP)=1
      GO TO 175
  190 IREQ(IHP)=1
      IREQC(1,I)=IHP
```

```
      IREQC(2,I)=IAP
      IREQC(3,I)=-J
      GO TO 400
  200 IF (PSCF(I) .GE. PSIF(IAP)) GO TO 185
      GO TO 190
C  OPCR(I)=OPC(J)=12:
C  NORMAL RATED THRUST--PSCF(J) MUST BE BETWEEN APPROACH AND TAKEOFF
C  POWER FOR REFERENCE FILE DATA:
  230 IF (IAP .GT. 0 .AND. ITP .GT. 0) GO TO 240
C  ERROR --- INSUFFICIENT DATA AVAILABLE FOR INTERPOLATION ETC.:
      GO TO 370
  240 IF (PSCF(I) .GE. PSIF(IAP)) GO TO 250
C  WARNING MESSAGE PRINTED BECAUSE OPCR=12 REFERENCE POWER SETTING IS
C  LESS THAN APPROACH POWER SETTING:
      WRITE(6,2300) OPCC(I),ACC
  250 IREQC(3,I)=J
      GO TO 118
C  OPCR(I)=OPC(J)=15 --- STOL TAKEOFF:
C  I1=17 --- STOL APPROACH:
  260 I1=17
  265 DO 270 JJ=1,N
      IF (OPC(JJ) .EQ. OPP(I1)) GO TO 280
  270 CONTINUE
C  ERROR --- EITHER STOL TAKEOFF OR APPROACH DATA MISSING, THUS CAN'T
C            INTERPOLATE ETC.:
      GO TO 370
  280 IREQ(JJ)=1
      IREQC(3,I)=J
      IF (I1-16) 285,285,290
  285 IREQC(1,I)=J
      IREQC(2,I)=JJ
      GO TO 400
  290 IREQC(1,I)=JJ
      IREQC(2,I)=J
      GO TO 400
C  OPCR(I)=OPC(J)=16 --- STOL APPROACH:
C  I1=16 --- STOL TAKEOFF:
  300 I1=16
      GO TO 265
C  OPCR(I)=OPC(J)=04, 06, 07, OR 13:
C  LABEL 370:
C  ERROR --- INSUFFICIENT DATA AVAILABLE FOR INTERPOLATION ETC.:
  325 GO TO (370,330,340,350),ITAHC
  330 IREQC(3,I)=J
      GO TO 116
  340 IREQ(IAP)=1
      GO TO 190
  350 IF (PSIF(J) .GE. PSIF(IAP)) GO TO 355
C
      GO TO 340
  355 IF (PSCF(I) .GE. PSIF(IAP)) GO TO 330
      GO TO 115
C  CHECK FOR OPCR= 17, 18 OR 19 AND VX=IV:
  360 IF (OPCR(I) .NE. OPP(18) .AND. OPCR(I) .NE. OPP(19) .AND.
     1 OPCR(I) .NE. OPP(20)) GO TO 365
```

```
      IF (ICV(VX(I)) .EQ. IV(J)) GO TO 365
C  ERROR --- OMIT OPCC BECAUSE REQUESTED AIRSPEED NOT EQUAL TO REFERENCE
C            AIRSPEED AS REQUIRED FOR OPCC=17, 18 AND 19:
      GO TO 380
  365 IREQC(1,I)=J
      GO TO 400
C  *******************  ERROR STATEMENTS  *******************
C
C
C  ERROR --- INSUFFICIENT DATA AVAILABLE FOR INTERPOLATION OR
C            EXTRAPOLATION; DATA FOR OPCC(I) OMITTED FROM JOB:
  370 WRITE(6,2000) OPCC(I)
      GO TO 395
C  REQUESTED OUTPUT POWER SETTING NOT EQUAL TO THE REFERENCE POWER
C  SETTING AS REQUIRED FOR THIS OPCC:
  375 WRITE(6,2100) OPCC(I)
      GO TO 395
C  REQUESTED OUTPUT AIRSPEED NOT EQUAL TO THE REFERENCE AIRSPEED AS
C  REQUIRED FOR THIS OPCC:
  380 WRITE(6,2200) OPCC(I)
      GO TO 395
C  REQUESTED REFERENCE 'OPCR' IS NOT IN THE REFERENCE FILE:
  385 WRITE(6,2400) OPCC(I),OPCR(I)
C  'UPP(1)' IS A BLANK 10 CHARACTER FIELD:
      PC(1,I)=UPP(1)
      PC(2,I)=UPP(1)
  395 WRITE(6,2500) ACC
  400 CONTINUE
      RETURN
C  WHEN NP=0, DEFINE THE FOLLOWING VARIABLES AND COMPUTE PROFILE DATA
C  AND PRINTOUT FOR REFERENCE FILE DATA WITH REFERENCE FILE AIRSPEED
C  AND POWER SETTING;
  500 NP=N
      PSU=PS(2,1)
      DO 510 I=1,NP
      PC(1,I)=P(1,I)
      PC(2,I)=P(2,I)
      PSC(I)=PS(1,I)
      OPCC(I)=OPC(I)
      OPCR(I)=OPC(I)
      IREQ(I)=1
      IREQC(1,I)=I
  510 VX(I)=IV(I)
      RETURN
 2000 FORMAT(//2X,10(1H*), * ERROR--OMIT OPCC= *,A2/ 2X,*INSUFFICIENT RE
     1FERENCE DATA AVAILABLE FOR INTERPOLATION OR EXTRAPOLATION.*)
 2100 FORMAT(//2X,10(1H*), * ERROR--OMIT OPCC= *,A2,*, REFERENCE POWER S
     1ETTING*/ 2X,*NOT EQUAL TO REQUESTED OUTPUT POWER SETTING AS REQUIR
     2ED FOR THIS OPCC.*)
 2200 FORMAT(//2X,10(1H*), * ERROR--OMIT OPCC= *,A2,*, REFERENCE AIRSPEE
     1D*/ 2X,*NOT EQUAL TO REQUESTED OUTPUT AIRSPEED AS REQUIRED FOR THI
     2S OPCC.*)
 2300 FORMAT(//2X,10(1H*), * WARNING--- REQUESTED POWER SETTING FOR OPCC
     1=*,A2/ 2X,*SHOULD BE GREATER THAN REFERENCE POWER SETTING FOR APPR
     2OACH.  ACC= *,A3)
 2400 FORMAT(//2X,10(1H*),* ERROR--OMIT OPCC= *,A2,*, REFERENCE OPCR= *
```

```
     1,A2/ 2X,*IS NOT IN THE REFERENCE FILE.*)
2500 FORMAT( 2X,*AIRCRAFT CODE (ACC)= *,A3)
3000 FORMAT(F5.0)
      END
```

```
      SUBROUTINE DELTA6(PRDI,PRDC,K,PSIF,PSCF,IREQC,LFLG,VFCT,LIM,PSC
     1,EXTMX,ITP,IAP,IHP,IREF)
C  DECK 17  DELTA6
C*****************************************************************
C*****************************************************************
C
C  THIS SUBROUTINE APPLIES THE DELTA-6 ALGORITHM AND THE AIRSPEED
C  ADJUSTMENT TO THE SINGLE EVENT MEASURE DATA IN ARRAY PRDI.
C  IT IS CALLED ONE TIME FOR EACH MEASURE BEING COMPUTED.
C
C  K     --- INDEX OF OUTPUT OPCC.
C  VFCT  --- AIRSPEED ADJUSTMENT FACTOR FOR KTH OPCC.
C  OPC   --- ARRAY OF INPUT OPERATION POWER CODES FROM REFERENCE FILE.
C  OPCC  --- ARRAY OF OUTPUT OPERATION POWER CODES REQUESTED FOR THIS
C            AIRCRAFT RUN.
C  PRDI  --- INPUT  MEASURE DATA FOR EACH DISTANCE AND OPC.
C  PRDC  --- OUTPUT MEASURE DATA FOR EACH DISTANCE (COMPUTED HERE).
C  PSC   --- OUTPUT POWER SETTING FOR EACH OPCC (ARRAY).
C  PSCF  --- OUTPUT POWER SETTING FOR EACH OPCC (ARRAY--FLOATING POINT).
C  PSIF  --- INPUT POWER SETTING FOR EACH OPC (ARRAY--FLOATING POINT).
C  EXTMX--- MAXIMUM PERMITTED EXTRAPOLATION AT THE REFERENCE DISTANCE.
C  LIM   --- EXTRAPOLATION LIMIT FLAG; WHEN LIM=1, LIMIT IS CHECKED.
C  ITP   --- INDEX OF REFERENCE TAKEOFF OPC.
C  IAP   --- INDEX OF REFERENCE APPROACH OPC.
C  IHP   --- INDEX OF HIGHEST RANKING OPC WITH POWER SETTING LESS THAN
C            POWER SETTING AT APPROACH.
C  IREF --- FLAG USED TO INDICATE ADDITIONAL SLOPE REFERENCE INDICES
C            BECAUSE THE REFERENCE AND REQUESTED POWER SETTINGS ARE
C            ON DIFFERENT SIDES OF APPROACH POWER (FOR IREF>0,
C            TWO SLOPE LINES WERE USED; APPLIES TO RANKED OPC'S ONLY):
C    IREF=0 --- ONLY ONE SLOPE LINE REQUIRED.
C    IREF=1 --- SECOND SLOPE LINE USING REFERENCES 'IHP' TO 'IAP'.
C    IREF=2 --- SECOND SLOPE LINE USING REFERENCES 'IAP' TO 'ITP'.
C
C  IREQC -- FLAG ARRAY DEFINED FOR THE KTH OPCC:
C         (1)  IREQC(3,K)>0:
C              IREQC(1,K) AND IREQC(2,K) CONTAIN THE INDEX OF INPUT
C              MEASURE DATA REQUIRED TO COMPUTE SLOPE.
C              IREQC(3,K) IS THE INDEX OF THE INPUT MEASURE DATA TO WHICH
C              DELTA-6 ALGORITHM IS APPLIED (DETERMINED FROM OPCR(K)).
C         (2)  IREQC(3,K)=0:
C              NO DELTA-6 ALGORITHM IS APPLIED AND IREQC(1,K) CONTAINS
C              THE INDEX OF THE INPUT MEASURE DATA SET EQUAL TO THE OUTPUT
C              MEASURE DATA (WITH AIRSPEED ADJUSTMENT).
C         (3)  IREQC(3,K)=0 AND IREQC(1,K)=0:
C              NO OUTPUT DATA ARE COMPUTED FOR THE KTH OPCC, LFLG(K)=-1.
C         (4)  IREQC(3,K)<0:
C              CHECK MEASURE DATA OF HIGHEST RANKING POWER SETTING (INDEX
C              IREQC(1,K)) AND APPROACH POWER SETTING (INDEX IREQC(2,K)).
C              IF APPROACH DATA ARE GREATER OR EQUAL, USE ABSOLUTE VALUE
C              OF IREQC(3,K) AS IN (1) ABOVE.
C              IF APPROACH IS LESS, SET OUTPUT MEASURE DATA EQUAL TO
C              INPUT MEASURE DATA WITH INDEX EQUAL TO ABSOLUTE VALUE
C              OF IREQC(3,K) (WITH AIRSPEED ADJUSTMENT).
C
```

```
C  LFLG= 1 --- EXTRAPOLATION GREATER THAN 'EXTMX' DB FOR KTH OPCC.
C  LFLG=-1 --- NO MEASURE DATA FOR KTH OPCC.
C  LFLG= 0 --- DATA SHOULD BE GOOD.
C
C*************************************************************************
C*************************************************************************
      DIMENSION PRDI(22,6),PROC(22),PSIF(6),PSCF(12),IREQC(3,12),PSC(12)
C  STATEMENT FUNCTION USED FOR DELTA"6 INTERPOLATION:
      F(Y2,Y1,YB,X2,X1,XB,XC)=YB+(Y2-Y1)*(XC-XB)/(X2-X1)
      LAB=0
      K1=IREQC(1,K)
      K2=IREQC(2,K)
      KB=IREQC(3,K)
      IF (IREF-1) 5,250,260
    5 IF (KB) 110,60,10
   10 IF (LIM .EQ. 1) GO TO 150
   25 DO 40 I=1,22
C  APPLY DELTA"6 ALGORITHM AND CORRECT FOR AIRSPEED:
      PROC(I)=   F(PRDI(I,K2),PRDI(I,K1),PRDI(I,KB),PSIF(K2),PSIF(K1),
     1PSIF(KB),PSCF(K))-VFCT
   40 CONTINUE
      GO TO 200
   60 IF (K1) 100,100,70
C  APPLY AIRSPEED ADJUSTMENT WITH NO DELTA"6 ADJUSTMENT:
   70 DO 80 I=1,22
   80 PROC(I)=  PRDI(I,K1)-VFCT
      GO TO 200
C  LFLG=-1 --- NO DATA FOR KTH OPCC.
  100 LFLG=-1
      GO TO 200
C  CHECK SINGLE EVENT MEASURE DATA AT REFERENCE DISTANCE (ASSUMED
C  TO BE 1000 FEET -- I=8):
  110 I=8
      KK=IABS(KB)
      IF (K1 .EQ. IAP) GO TO 130
C  ASSUME K1=IHP AND PSIF(KK) < PSIF(IAP):
      IF (PSCF(K) .GT. PSIF(IAP) .AND. ITP .GT. 0) GO TO 260
C  IS MEASURE DATA AT HIGHEST RANKING POWER SETTING GREATER THAN
C  MEASURE DATA AT APPROACH (HIGHEST RANKING POWER SETTING IS LESS THAN
C  POWER SETTING AT APPROACH):
      IF (PRDI(I,K1) .GT. PRDI(I,K2)) GO TO 120
      KB=KK
      GO TO 10
  120 K1=KK
      GO TO 70
C  K1=IAP, K2=ITP, PSIF(KK) > PSIF(IAP):
  130 IF (PSCF(K) .LT. PSIF(K1)) GO TO 250
C  PSCF(K) AND PSIF(KK) > PSIF(IAP):
      KB=KK
      GO TO 10
C  CHECK FOR EXTRAPOLATION GREATER THAN 'EXTMX' (5 DB) DB AND RECOMPUTE
C  THE PSCF POWER SETTING WHEN THE LIMIT IS EXCEEDED, ALSO SET LFLG=1;
C  CHECK 1000 FT. (I=8) AIR-TO-GROUND DATA ONLY;
C  CHECK ONLY 'SELX' DATA WHEN ALL ARE COMPUTED:
  150 I=8
```

```
      PRDCA=PRDI(I,K3)
  152 EXTCK =     F(PRDI(I,K2),PRDI(I,K1),PRDCA,PSIF(K2),PSIF(K1),
     1PSIF(KB),PSCF(K))
      IF (LAB-1) 155,330,430
  155 IF (KB .EQ. K1 .OR. KB .EQ. K2) GO TO 160
      EXT=PRDI(I,KB)+EXTMX
      IF (EXTCK .GT. EXT) GO TO 170
      EXT=PRDI(I,KB)-EXTMX
      GO TO 165
  160 EXT=PRDI(I,K2)+EXTMX
      IF (EXTCK .GT. EXT) GO TO 170
      EXT=PRDI(I,K1)-EXTMX
  165 IF (EXTCK .LT. EXT) GO TO 170
      GO TO 25
C  SET EXTRAPOLATION LIMIT FLAG (LFLG) AND COMPUTE NEW PSCF(K)
C  CORRESPONDING TO THE EXTRAPOLATION LIMIT; 'EXT' IS THE LIMITING
C  SELX ETC. VALUE:
  170 PRDCA=PRDI(I,KB)
  172 PSCF(K)=PSIF(K3)+(EXT-PRDCA)*(PSIF(K2)-PSIF(K1))/(PRDI(I,K2)-
     1PRDI(I,K1))
      LFLG= 1
C  REFORMAT NEW PSCF(K) AND STORE IN PSC(K) FOR PRINTING LATER IN THE
C  PROGRAM:
      IF (PSCF(K) .GT. 999.) GO TO 175
      IF (PSCF(K) .LT. 10.0) GO TO 180
      ENCODE(5,3000,PSC(K)) PSCF(K)
      IF (LAB-1) 25,340,435
  175 I=ICV(PSCF(K))
      ENCODE(5,3100,PSC(K)) I
      IF (LAB-1) 25,340,435
  180 ENCODE(5,3200,PSC(K)) PSCF(K)
      IF (LAB-1) 25,340,435
  200 CONTINUE
      RETURN
C
C*****************************************************************
C  THE REMAINDER OF THIS SUBROUTINE SETS UP AND COMPUTES THE PROFILE
C  DATA FOR POWER SETTINGS WHERE THE REFERENCE (OPCR) POWER SETTING
C  (PSIF(KB) OR PSIF(KK)) AND THE REQUESTED POWER SETTING (PSCF(K))
C  ARE ON OPPOSITE SIDES OF THE APPROACH POWER SETTING (PSIF(IAP)):
C*****************************************************************
C
C  K1=IAP, K2=ITP, PSIF(KK)>PSIF(IAP), PSCF(K)<PSIF(IAP):
  250 LAB=1
      GO TO 270
C  K1=IHP, K2=IAP, PSIF(KK)<PSIF(IAP) AND PSCF(K)>PSIF(IAP):
  260 LAB=2
  270 I=8
      IF (LIM .EQ. 1) GO TO (290,280),LAB
      IF (PRDI(I,IHP) .GT. PRDI(I,IAP)) GO TO (360,470),LAB
      IF (LAB-1) 340,340,440
  280 IF (PRDI(I,IHP) .GT. PRDI(I,IAP)) GO TO 420
C  COMPUTE MEASURE VALUE AT APPROACH POWER:
  290 PRDCA=F(PRDI(I,K2),PRDI(I,K1),PRDI(I,KK),PSIF(K2),PSIF(K1),
     1 PSIF(KK),PSIF(IAP))
```

```
      IF (LAB-1) 305,305,415
C  CHECK EXTRAPOLATION LIMIT AT APPROACH POWER:
  305 EXT=PRDI(I,KK)-EXTMX
      IF (PROCA .LE. EXT) GO TO 315
C  GO TO 360--> ZERO SLOPE, THUS PRDC(I)=PROCA AT PSIF(IAP):
      IF (PRDI(I,IHP) .GT. PRDI(I,IAP)) GO TO 360
      K1=IHP
      K2=IAP
      KB=IAP
C  CHECK FINAL EXTRAPOLATION LIMIT AT PSCF(K)--LABEL 152:
      GO TO 152
C  EXTRAPOLATION LIMIT EXCEEDED AT PSIF(IAP), COMPUTE NEW PSCF(K):
  315 IREQC(3,K)=KK
  320 KB=KK
C  NOTE: NEW PSCF(K) WILL BE > PSIF(IAP):
      LAB=0
      GO TO 170
C  CHECK EXTRAPOLATION LIMIT AT 'PSCF(K)':
  330 IF (EXTCK .LT. EXT) GO TO 172
C  SET INDICES TO COMPUTE PROCA AT PSIF(IAP) FOR EACH DISTANCE, THEN
C  PROC(I) AT PSCF(K):
  340 K1=IHP
      K2=IAP
      KB=ITP
      K3=IAP
      IREF=1
      GO TO 455
C  MEASURE VALUE AT IHP> AT IAP, SET UP TO COMPUTE MEASURE VALUE
C  AT PSIF(IAP):
  360 DM=PSIF(IAP)
      KB=KK
      IREF=1
      GO TO 475
C  CHECK EXTRAPOLATION LIMIT AT APPROACH POWER:
  415 EXT=PRDI(I,KK)+EXTMX
C  LABEL 320--> DETERMINE NEW PSCF(K) LE PSIF(IAP):
      IF (PROCA .GE. EXT) GO TO 320
      GO TO 425
  420 PROCA=PRDI(I,KK)
      EXT=PROCA+EXTMX
C  SET INDICES TO CHECK FINAL EXTRAPOLATION LIMIT AT PSCF(K):
  425 K1=IAP
      K2=ITP
      KB=IAP
      GO TO 152
C  CHECK EXTRAPOLATION LIMIT AT 'PSCF(K)':
  430 IF (EXTCK .GT. EXT) GO TO 172
  435 IF (PRDI(I,IHP) .GT. PRDI(I,IAP)) GO TO 470
      GO TO 450
C  SET INDICES TO COMPUTE PROCA AT PSIF(IAP) FOR EACH DISTANCE, THEN
C  COMPUTE PROC(I) AT PSCF(K):
  440 K1=IAP
      K2=ITP
      KB=IAP
  450 K3=IHP
```

```
      IREF=2
C   COMPUTE MEASURE VALUE (PRDCA) AT APPROACH, THEN MEASURE VALUE
C   (PRDC(I)) AT PSCF(K):
  465 DO 460 I=1,22
      PRDCA=F(PRDI(I,KB),PRDI(I,K3),PRDI(I,KK),PSIF(KB),PSIF(K3),PSIF(KK
     1),PSIF(IAP))
      PRDC(I)=F(PRDI(I,K2),PRDI(I,K1),PRDCA,PSIF(K2),
     1 PSIF(K1),PSIF(IAP),PSCF(K))-VFCT
  460 CONTINUE
      RETURN
C   MEASURE VALUE AT 'IHP' > AT 'IAP', SET UP TO COMPUTE MEASURE VALUE
C   AT PSCF(K) WITH REFERENCE AT 'IAP':
  470 DM=PSCF(K)
      KB=IAP
      IREF=2
C   COMPUTE MEASURE VALUE AT 'PSIF(IAP)' OR 'PSCF(K)' FOR CASES WITH
C   MEASURE VALUE AT 'IHP' > AT 'IAP':
  475 DO 485 I=1,22
      PRDC(I)=F(PRDI(I,ITP),PRDI(I,IAP),PRDI(I,KK),PSIF(ITP),PSIF(IAP),
     1 PSIF(KB),DM)-VFCT
  485 CONTINUE
      RETURN
 3000 FORMAT(F5.1)
 3200 FORMAT(F5.2)
 3100 FORMAT( I5)
      END
```

```
      SUBROUTINE SUMRY(IPU,COMD,EXTMX,N,NP,SOURCE,LFLG,IREF,ITP,IAP,IHP)
C  DECK 18   SUMRY
C*********************************************************************
C
C  THIS SUBROUTINE IS CALLED FROM THE MAIN ROUTINE ONCE PER AIRCRAFT
C  TO PRINT A SUMMARY OF THE INPUT AND OUTPUT DATA FOR EACH AIRCRAFT.
C  IT IS CALLED AT THE END OF EACH AIRCRAFT ANALYSIS.
C
C  ALL PRINT LINES ARE LESS THAN OR EQUAL TO 84 CHARACTERS AND THUS
C  COULD BE PART OF THE NOISENAP 'CHRONICLE'.
C
C*********************************************************************
      DIMENSION YN(2),COMD(6),SOURCE(2,6),LFLG(12),IREF(12)
      COMMON /COMPC/IV(6),IMS(5),P(2,6),OPC(6),OPCC(12),PS(2,6),PSC(12),
     1 PSU,PSIF(6),PSCF(12),IREQC(3,12),VX(12),SX(22),ATNC(24),ATNR(24),
     2 DELN,IPTC,IPROP,MEAS(3),OPCR(12),PC(2,12)
      COMMON /HEADC/ AC,DATE,ACC,IPAGE,IVX,ITEMP,IRHUM,IVER,PV,CRI,
     1 ET(2),OTC
      DATA YN/3HNO ,3HYES/,BLK/1H /,FL/1H</,FG/1H>/
C  PRINT RUN 'ID' INFORMATION:
      WRITE(6,2000) AC
      WRITE(6,2010) IVER,ACC,PV,CRI,DATE,DELN
C  PRINT INPUT HEADING LINES AND SUMMARY DATA FOR EACH REFERENCE FILE
C  OPERATION POWER CODE (OPC):
      WRITE(6,2020)
      DO 50 L=1,N
   50 WRITE(6,2030) ACC,COMD(L),OPC(L),PS(1,L),PS(2,L),IV(L),P(1,L),
     1P(2,L),SOURCE(2,L)
C  PRINT OUTPUT HEADING LINES AND DATA WHICH APPLY TO ALL OPCC'S:
      WRITE(6,2060)
      WRITE(6,2070) YN(IPU+1)
      WRITE(6,2080) EXTMX,ET
      WRITE(6,2090) ITEMP,IRHUM
      WRITE(6,2110)
      ICK1=0
      ICK2=0
C  PRINT SUMMARY OF OUTPUT DATA FOR EACH REQUESTED POWER SETTING:
      DO 200 I=1,NP
C  CHECK EXTRAPOLATION FLAG:
      IF (LFLG(I)) 120,140,130
C  NO OUTPUT DATA COMPUTED FOR ITH OPCC:
  120 WRITE(6,2120) ACC,OPCC(I),OTC,PV,CRI,OPCC(I),FG,PSC(I),PSU,VX(I)
     1,PC(1,I),PC(2,I)
      ICK1=1
      GO TO 200
C  EXTRAPOLATION LIMIT EXCEEDED FOR THE ITH OPCC:
  130 ICK2=1
      FLG=FL
      GO TO 150
  140 FLG=BLK
C  IREQC CONTAINS INDICIES OF REFERENCE FILE DATA USED AS THE REFERENCE
C  POINT AND SLOPE POINTS IN DELTA"6 COMPUTATIONS (SEE SUB. 'DELTA6'):
  150 IF (IREQC(3,I)) 170,160,180
C  I1 IS THE REFERENCE POINT -- NO SLOPE IS REQUIRED:
  160 I1=IREQC(1,I)
```

```
      WRITE(6,2120) ACC,OPCC(I),OTC,PV,CRI,OPSC(I),FLG,PSC(I),PSU,VX(I),
     1 PC(1,I),PC(2,I),YN(1),ACC,COMD(I1)
      GO TO 200
C  I1 IS THE REFERENCE POINT; NEGATIVE VALUE MEANS THE MEASURE DATA
C  FOR THE HIGHEST RANKING POWER SETTING LESS THAN APPROACH POWER WAS
C  CHECKED:
  170 I1=IABS(IREQC(3,I))
      GO TO 185
C  I1 IS THE REFERENCE POINT.  I2 AND I3 ARE SLOPE POINTS:
  180 I1=IREQC(3,I)
  185 I2=IREQC(1,I)
      I3=IREQC(2,I)
      WRITE(6,2120) ACC,OPCC(I),OTC,PV,CRI,OPSC(I),FLG,PSC(I),PSU,VX(I),
     1 PC(1,I),PC(2,I),YN(1),ACC,COMD(I1),YN(1),ACC,COMD(I2),YN(1),ACC,
     2COMD(I3)
C  PRINT ADDITIONAL LINE WHEN SECOND SLOPE IS REQUIRED (PS AND
C  PSC DATA ON OPPOSITE SIDES OF APPROACH). IREF, ITP, IAP, AND
C  IHP ARE DEFINED IN SUBROUTINE 'DELTA6':
      IF (IREF(I)-1) 200,190,194
  190 I1=IHP
      I2=IAP
      GO TO 196
  194 I1=IAP
      I2=ITP
  196 WRITE(6,2125) YN(1),ACC,COMD(I1),YN(1),ACC,COMD(I2)
  200 CONTINUE
C  PRINT GENERAL INFORMATION LINES:
      WRITE(6,2130)
C  PRINT FOOTNOTES AS REQUIRED:
      IF (ICK1 .GT. 0) WRITE(6,2140)
      IF (ICK2 .GT. 0) WRITE(6,2150)
      RETURN
 2000 FORMAT(1H1,     *SUMMARY OF I/O FOR AIRCRAFT: *,A10)
 2010 FORMAT(/ 1X,*PROGRAM:  OMEGA 10.*,I1/
     1    1X,*AIRCRAFT CODE: *,A3/  1X,*PROFILE VERSION CODE: *,A1/
     2    1X,*COMDECK REVISION IDENTIFIER: *,A1/  1X,*DATE: *,A10/
     3    1X,*DELTA N (OR DELN)=*,F6.2,* DB*)
 2020 FORMAT(// 1X,35(1H*),* INPUT DATA *,35(1H*)
     1/2X,*COMDECK*, 5X,*POWER*,4X,*AIRSPEED POWER DESCRIPTION*,5X,
     2*DATE OF*/4X, *NAME    OPC    SETTING*,5X,*KNOTS*, 24X,*NORM. RUN*)
 2030 FORMAT(1X,*N*,A3,A5,2X,A2,1X,A5,1X,A5,I6,3X,2A10,2X,A10)
 2060 FORMAT(// 1X,34(1H*),* OUTPUT DATA *,35(1H*))
 2070 FORMAT(1X, *IS PROFILE DATA WRITTEN ON FILE *TAPE3*?--*,A3)
 2080 FORMAT(1X, *MAXIMUM PERMITTED PROFILE DATA EXTRAPOLATION IS:*,F6.2
     1,* DB*/ 1X, *ENGINE TYPE FOR ALL PROFILE DATA: *,A10,A5)
 2090 FORMAT( 1X,*METEOROLOGY:  TEMP*,6X,*=*,I6,* F*/
     1  15X,*REL HUMID =*,I6,* %*)
 2110 FORMAT(  *0PROFILE*,8X,*POWER* 3X,*AIRSPEED*, 1X,*POWER DESCRIPTIO
     1N*, 9X,*NORMALIZED COMDECKS*/ 3X,*ID*,4X,*OPC*,3X,*SETTING*,4X,
     2 *KNOTS*,23X,*REFERENCE   SLOPE REF. POINTS*)
 2120 FORMAT(1X,A3,A2,3A1,1X,A2,A1,A5,1X,A6,F6.1,2X,2A10,3(1X,A1,A3,A5))
 2125 FORMAT( 63X,2(1X,A1,A3,A5))
 2130 FORMAT(// 1X,30(1H*),* GENERAL INFORMATION *,31(1H*)/
     1 1X,*OPC --- OPERATION POWER CODE.*/
     2 1X,*THE ENGINE TYPE GIVEN ABOVE IS TAKEN FROM THE LAST REFERENCE
```

```
     3FILE DATASET;*/ 1X,*IT IS ASSUMED TO BE THE SAME FOR ALL DATASETS.051100
     4*/1X,*PROFILE COMDECK NAME = SYMBOL E, S OR L + PROFILE ID LISTED 051120
     5ABOVE*/)                                                          051140
 2140 FORMAT(1X, *> NO PROFILE DATA COMPUTED FOR THIS OPC; SEE PROGRAM E051150
     1RROR MESSAGES.*)                                                  051180
 2150 FORMAT(1X, *< POWER SETTING EXTRAPOLATION LIMITED BY AMRL/BBE, W-P051200
     1AFB.*)                                                            051220
      END                                                               051240
```

I N D E X

********** SUPER INDEX **********

SYMBOL	-	ROUTINES IN WHICH THE SYMBOL IS USED						
A9	-	OUTH						
ABC	-	ALPH						
ABS	-	CPTC	ICV	OMEGA10	SETUPD6			
AC	-	HEAD	OMEGA10	OUTG	OUTJ	PPFDAT	SUMRY	TITPG
ACC	-	HEAD	OMEGA10	OUTG	OUTJ	PPFDAT	SETUPD6	SUMRY	TITPG
AL	-	CAL						
ALA	-	CAL	COIST					
ALN	-	ALPH						
ALOG10	-	CAL	COIST	CPNL	OMEGA10			
ALPH	-	OMEGA10						
ALTA	-	COIST						
ALTX	-	COIST						
ALX	-	CAL	COIST					
AMAX1	-	CPNL	OUTJ					
AMX	-	CPNL	CPTC	OUTJ				
ASK	-	HEAD	OMEGA10					
ATKN	-	ALPH						
ATNC	-	COIST	OMEGA10					
ATNR	-	COIST	OMEGA10					
AW	-	CAL						
BLK	-	HEAD	IPA	OMEGA10	OUTG	OUTH	OUTJ	PPFDAT	SUMRY
C	-	CPTC						
C1	-	COIST						
C2	-	COIST						
C3	-	COIST						
CAL	-	COIST	OMEGA10					
CD	-	OMEGA10						
COIST	-	OMEGA10						
CKEY	-	PPFDAT						
COMD	-	OMEGA10	PPFDAT	SUMRY				
CPNL	-	COIST	OMEGA10					
CPTC	-	COIST	OMEGA10					
CR1	-	OMEGA10	PPFDAT	SUMRY				
D1	-	COIST						
D2	-	COIST						
D2X	-	COIST						
D3	-	COIST						
DACC	-	OMEGA10						

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********** SUPER INDEX **********

```
DASH    -  IPA       OMEGA10   OUTJ
DATE    -  HEAD      OMEGA10   OUTG      OUTJ      PPFDAT    SUMRY     TITPG
DATEN   -  OMEGA10   OUTG      OUTJ
DD      -  ICV
DELN    -  CDIST     HEAD      OMEGA10   OUTJ      SUMRY
DELTA6  -  OMEGA10
DG      -  CDIST
DH1     -  HEAD
DH2     -  HEAD
DI1     -  HEAD
DKEY    -  PPFDAT
DM      -  DELTA6    OUTH
DOPC    -  OMEGA10
DOT     -  IPA       OMEGA10   OUTJ
DR      -  ICV
DRAG    -  OMEGA10   OUTG
DS1     -  OMEGA10
DS2     -  OMEGA10
EA      -  CDIST
EOF     -  OMEGA10
EPNLA   -  CDIST
EPNLX   -  CDIST
ET      -  OMEGA10   OUTG      PPFDAT    SUMRY
EXT     -  DELTA6
EXTCK   -  DELTA6
EXTMX   -  DELTA6    OMEGA10   SUMRY
F       -  ALPH      CPTC      DELTA6
F1      -  OUTH
F2      -  OUTH
F3      -  OUTH
F4      -  OUTH
F5      -  OUTH
F6      -  OUTH
F7      -  OUTH
F9      -  OUTH
FA      -  OUTH
FC      -  OUTH
FG      -  SUMRY
FI      -  OUTH
FJ      -  CPNL
```

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********** SUPER INDEX **********

I N D E X

********** SUPER INDEX **********

```
IHP     -  DELTA6    OMEGA10   SETUPD6   SUMRY
II      -  OUTG      OUTJ      PPFDAT    SETUPD6
IJ      -  PPFDAT
IK      -  SETUPD6
IL      -  ALPH      CAL
IL1     -  CPTC
IL2     -  CPTC
IL3     -  CPTC
ILL     -  CPTC
IMS     -  CDIST     OMEGA10   OUTG
INPUT   -  OMEGA10
IORD    -  OMEGA10   OUTG      OUTH      OUTJ
IP      -  HEAD      OUTJ
IPA     -  OMEGA10
IPAGE   -  HEAD      OMEGA10   OUTG      OUTJ
IPF     -  OMEGA10   OUTH
IPP     -  HEAD      OUTJ
IPR     -  OMEGA10   TITPG
IPROP   -  CDIST     HEAD      OMEGA10   OUTJ
IPRR    -  OMEGA10
IPTC    -  CDIST     CPTC      OMEGA10   OUTH
IPU     -  OMEGA10   SUMRY
IRD     -  CDIST     OMEGA10   OUTH
IREF    -  DELTA6    OMEGA10   SUMRY
IREQ    -  OMEGA10   SETUPD6
IREQC   -  DELTA6    OMEGA10   PPFDAT    SETUPD6   SUMRY
IRHUM   -  HEAD      OMEGA10   OUTJ      PPFDAT    SUMRY
IRK     -  SETUPD6
ISC     -  OUTG      OUTJ
ISEQD   -  OUTH
ISEQF   -  OUTH
ISIGN   -  ICV
ISPL    -  CDIST     OUTH
ISRC    -  OUTG
ITAHC   -  SETUPD6
ITEMP   -  HEAD      OMEGA10   OUTJ      PPFDAT    SUMRY
ITP     -  DELTA6    OMEGA10   SETUPD6   SUMRY
IV      -  CDIST     OMEGA10   OUTG      SETUPD6   SUMRY
IVER    -  HEAD      OMEGA10   OUTG      OUTJ      PPFDAT    SUMRY     TITPG
IVX     -  HEAD      OMEGA10   OUTJ      PPFDAT
```

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I N D E X

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```
OPP      -  SETUPD6
ORD      -  IPA       OUTJ
ORDJ     -  IPA
OTC      -  HEAD      OMEGA10   OUTG      OUTJ      PPFDAT    SUMRY
OUTG     -  OMEGA10
OUTH     -  OMEGA10
OUTJ     -  OMEGA10
OUTPUT   -  OMEGA10
P        -  OMEGA10   OUTG      SETUPD6   SUMRY
PAG      -  HEAD      OUTJ
PB       -  IPA       OUTG      OUTJ
PC       -  HEAD      OUTJ      PPFDAT    SETUPD6   SUMRY
PD       -  IPA       OUTJ
PG       -  HEAD      OUTJ      TITPG
PM       -  IPA       OUTJ
PNL      -  CPNL
PNLA     -  CPNL
PNLTA    -  CDIST
PNLTX    -  CDIST     OMEGA10
PNLX     -  CDIST     CPNL
PP       -  OUTG      OUTJ
PPFDAT   -  OMEGA10
PRDA     -  CDIST     OMEGA10
PRDC     -  DELTA6    OMEGA10   PPFDAT
PRDCA    -  DELTA6
PRDG     -  CDIST     OMEGA10
PRDI     -  DELTA6
PS       -  OMEGA10   OUTG      SETUPD6   SUMRY
PSC      -  DELTA6    HEAD      OMEGA10   OUTJ      PPFDAT    SETUPD6   SUMRY
PSCF     -  DELTA6    OMEGA10   SETUPD6
PSDM     -  OMEGA10
PSIF     -  DELTA6    OMEGA10   SETUPD6
PSU      -  HEAD      OMEGA10   OUTJ      PPFDAT    SETUPD6   SUMRY
PTC      -  CDIST     CPTC      OMEGA10
PV       -  HEAD      OMEGA10   OUTJ      PPFDAT    SUMRY     TITPG
R        -  ICV
RANK     -  SETUPD6
REF      -  PPFDAT
REL      -  ALPH
RETURN   -  ALPH      ATKN      CAL       CDIST     CPNL      CPTC      DELTA6    FNDY
```

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********** SUPER INDEX **********

		HEAD	ICV	IPA	OUTG	OUTH	OUTJ	PPFDAT	SETUPD6
		SUMRY	TITPG						
RN	-	PPFDAT							
RV	-	CDIST	OMEGA10						
S	-	CPTC							
SA	-	CPTC							
SAVE	-	OUTG	OUTJ						
SELA	-	CDIST							
SELTA	-	CDIST							
[illegible]	-	CDIST							
[illegible]	-	CDIST							
[illegible]	-	OMEGA10	OUTH	OUTJ					
[illegible]	-	OMEGA10							
[illegible]	-	CDIST							
SNTH	-	CDIST							
SOURCE	-	OMEGA10	OUTG	SUMRY					
SP	-	CPTC							
SPL	-	CPTC	FNOY						
SPLA	-	CAL	CDIST	CPNL	CPTC				
SPLL	-	CPNL							
SPLP	-	CPTC							
SPLPP	-	CPTC							
SPLX	-	CAL	CDIST	CPNL	CPTC	OUTH			
SR	-	OMEGA10	OUTG						
STOP	-	OMEGA10							
SUM	-	CPNL							
SUMRY	-	OMEGA10							
SX	-	CDIST	OMEGA10						
SYM	-	OUTJ							
TAPE3	-	OMEGA10							
TAPE5	-	OMEGA10							
TAPE6	-	OMEGA10							
TAPE7	-	OMEGA10							
TEMP	-	ALPH							
THETA	-	CDIST							
TITLE	-	OUTJ							
TITPG	-	OMEGA10							
VAR	-	OUTJ							
VFC	-	OMEGA10							
VFCT	-	CDIST	DELTA6	OMEGA10					

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```
VREF     -  CDIST
VX       -  OMEGA10    SETUP06    SUMRY
W        -  OMEGA10
X        -  ALPH       ATKN       OMEGA10    OUTG       OUTJ
X1       -  DELTA6
X2       -  DELTA6
XB       -  DELTA6
XC       -  DELTA6
XI       -  ATKN
XX       -  ATKN
Y        -  ALPH       ATKN
Y1       -  DELTA6
Y2       -  DELTA6
YC       -  DELTA6
YN       -  SUMRY
YY       -  ATKN
ZERO     -  OMEGA10
```

****

I N D E X
END OF COMPUTATION,
1 DECEMBER 1967 VERSION.

APPENDIX J
OMEGA 11 PROGRAM LISTING

The listing for the OMEGA 11 program is provided in the following pages. Included at the end of the program listing is a Super Index which lists all variable names defined in this program as well as all routines in which they are used.

```
      PROGRAM OMEGA11(INPUT,OUTPUT,TAPE5=INPUT,TAPE6=OUTPUT,TAPE7,TAPE2)
C  DECK MAIN 'OMEGA11'
C***********************************************************************
C***********************************************************************
C**                                                                   **
C**    PROGRAM FILES:                                                 **
C**       INPUT OR TAPE5 --- CODE SHEET INPUT FILE;                   **
C**       OUTPUT OR TAPE6 --- OUTPUT FILE FOR 'OMEGA 11' TAB OUTPUT;  **
C**       TAPE2 --- PROFILE  DATASET   OUTPUT FILE (COULD BE COPIED TO **
C**                 THE PUNCH FILE).                                  **
C**       TAPE7 --- NORMALIZED DATASET INPUT FILE;                    **
C**                                                                   **
C***********************************************************************
C***********************************************************************
C**                                                                   **
C**     THIS OMEGA 11 PROGRAM WAS WRITTEN BY THE UNIVERSITY OF DAYTON **
C**     RESEARCH INSTITUTE UNDER CONTRACT F33615-75-C-5040 WITH THE   **
C**     6570-TH AEROSPACE MEDICAL RESEARCH LABORATORY (AMRL/BBE) AT   **
C**     WRIGHT-PATTERSON AIR FORCE BASE, OHIO  45433.                 **
C**                                                                   **
C***********************************************************************
C**             OMEGA 11  PROGRAM  VERSION  1   (12 APR 1977)         **
C***********************************************************************
C***********************************************************************
C**                                                                   **
C**     THE FOLLOWING SUBROUTINES ARE USED BY THIS PROGRAM:           **
C**                                                                   **
C**     DK01---TESTN     DK06---ICV      DK11---CAL      DK16---SUMRY **
C**     DK02---ALPH      DK07---CDIST    DK12---PPFDAT   DK17---EDIT  **
C**     DK03---ATKN      DK08---CPNL     DK13---TITPG    DK18---ERR   **
C**     DK04---HEADS     DK09---FNOY     DK14---PLT      DK19---FINTP **
C**     DK05---RSPLN     DK10---CPTC     DK15---RANK     DK20---ITER  **
C**                                                                   **
C***********************************************************************
C**                                                                   **
C**                                                                   **
C**     THIS OMEGA 11 PROGRAM WAS WRITTEN TO ANALYZE GROUND RUN-UP NOISE**
C**     MEASUREMENTS FROM NORMALIZED SOUND PRESSURE LEVEL (SPL) DATA  **
C**     FOR 1/3 OCTAVE FREQUENCY BANDS 17 TO 40 AND ANGLES 0 TO 180   **
C**     DEGREES. THE PROGRAM INPUTS THE NORMALIZED DATA FROM THE      **
C**     THE REFERENCE FILE (TAPE7) CREATED FROM THE NOISEFILE 2       **
C**     DATABASE.  THESE REFERENCE DATA WERE NORMALIZED TO 59 F,      **
C**     70 %, 29.92 IN HG, AND 250.0 FEET FROM THE SOURCE BY THE      **
C**     OMEGA 8 PROGRAM.                                              **
C**                                                                   **
C**                                                                   **
C**     THE PROGRAM PRINTS THE FOLLOWING DATA WHEN CODE SHEET PARAMETER **
C**     IPR=1:                                                        **
C**                                                                   **
C**        1) TITLE OR COVER PAGE;                                    **
C**        2) TEST SUMMARY PAGE;                                      **
C**        3) NORMALIZED 'SPL' DATA --- PAGE C;                       **
C**        4) PERCEIVED NOISE LEVEL (PNL) PROFILE DATA --- PAGE D;    **
C**        5) TONE-CORRECTED, PERCEIVED NOISE LEVEL (PNLT) PROFILE    **
C**           DATA --- PAGE E;                                        **
```

```
C**      6) A-WEIGHTED OVERALL SOUND LEVEL (AL) PROFILE DATA - PAGE F;**
C**      7) TONE-CORRECTED, A-WEIGHTED OVERALL SOUND LEVEL (ALT)      **
C**         PROFILE DATA --- PAGE G;                                  **
C**      8) TAB PLOT OF NOISE LEVEL (PNLT, AL AND ALT) AS A FUNCTION  **
C**         OF ANGLE AROUND SOURCE FOR NORMALIZED DISTANCE --- PAGE J;**
C**                                                                   **
C**                                                                   **
C**   THE PROFILE DATA ARE COMPUTED AND PRINTED AS REQUESTED BY THE   **
C**   'MEAS' CODE SHEET PARAMETER.                                    **
C**                                                                   **
C**   THE  PROFILE DATA CONTAIN NOISE LEVELS FOR 22 DISTANCES         **
C**   (200 TO 25000 FEET).              THE 'PNLT', 'AL' AND 'ALT'    **
C**   PROFILE DATASETS ARE WRITTEN ON FILE 'TAPE2' (SEE 'IEDIT'       **
C**   PARAMETER).                                                     **
C**                                                                   **
C**   FOR IPR=0 OR BLANK, ONLY THE TEST SUMMARY PAGE IS PRINTED.      **
C**                                                                   **
C**                                                                   **
C*********************************************************************
C*********************************************************************
C
C  THE FOLLOWING ARE SOME OF THE VARIABLES USED BY THE PROGRAM (SEE
C  DOCUMENTATION FOR A MORE COMPLETE LIST):
C
C  OPC(6) --- ARRAY CONTAINING THE REFERENCE OPERATION POWER CODES.
C  OPCC(6) -- ARRAY CONTAINING THE OUTPUT OPERATION POWER CODES.
C  M=3 --- 1/3 OCTAVE BAND DATA ---ALL DATA MUST BE 1/3 OCTAVE.
C  MM=1 --- FREQUENCY ARRAY INDEX INCREMENT FOR M=3.
C  IL=1 --- FREQUENCY INDEX CORRESPONDING TO BAND 17.
C  IH=24 -- FREQUENCY INDEX CORRESPONDING TO BAND 40.
C  IL  IS IBNL AND IH IS IBNH IN SOME OF THE SUBROUTINES.
C  NC --- NUMBER OF ANGLES --- ALWAYS 19 FOR NORMALIZED DATA.
C  N  --- NUMBER OF REFERENCE OPC'S FOR THIS AIRCRAFT.
C  NP --- NUMBER OF OUTPUT OPCC'S TO BE COMPUTED FOR THIS ACC.
C  DIST --- STANDARD REFERENCE DISTANCE IN FEET; MUST BE WITHIN
C           1% OF ONE OF THE STANDARD PROFULE DISTANCES.
C  NN=6 ---MAXIMUM NUMBER OF REFERENCE OPERATION POWER CODES PER ACC.
C  NPM=6 --MAXIMUM NUMBER OF OUTPUT OPCC'S PER AIRCRAFT SET.
C  IPR=1 --- PRINT NORMALIZED SPL AND PROFILE DATA ON FILE 'TAPE6'.
C  IPR=0 --- OMIT ALL 'TAPE6' OUTPUT EXCEPT ERROR STATEMENTS.
C  IEDIT<0 --- OMIT ALL PROFILE DATA FROM FILE 'TAPE2'.
C  IEDIT=0 --- CALL SUB. 'EDIT' TO SELECT 10 ANGLES FOR REQUESTED
C                PROFILES MEASURES.
C  IEDIT>0 --- WRITE ALL ANGLES ON FILE 'TAPE2' FOR REQUESTED PROFILE
C                MEASURES.
C  MEAS(1)>0 --- COMPUTE 'PNL' AND 'PNLT' PROFILE DATA.
C  MEAS(2)>0 --- COMPUTE 'AL' PROFILE DATA.
C  MEAS(3)>0 --- COMPUTE 'ALT' PROFILE DATA.
C  MEAS=0 OR BLANK --- CORRESPONDING PROFILE DATA ARE OMITTED.
C  FMXER --- MAXIMUM ANGLE SELECTION ERROR PERMITTED WITHOUT AN ERROR
C              MESSAGE BEING PRINTED.
C  IERR --- FLAG SET BY SUBROUTINE 'RSPLN'; IF IERR>0, OMIT COMPUTATIONS
C             FOR THIS 'ACC'.
C  SX(22) --- STANDARD DISTANCE DATA USED TO COMPUTE PROFILE DATA.
C  SPLX(19,24) --- ARRAY USED BY SUBROUTINE 'CDIST' FOR TEMPORARY
```

```
C                 STORAGE OF SPL DATA FOR EACH PROFILE DISTANCE.
C   PNLX(19,22,2) --- ARRAY CONTAINING 'PNL'  PROFILE DATA FOR 19 ANGLES
C                     AND 22 PROFILE DISTANCES FOR 2 POWER SETTINGS.
C   PNLTX(19,22,2) -- ARRAY CONTAINING 'PNLT' PROFILE DATA FOR 19 ANGLES
C                     AND 22 PROFILE DISTANCES FOR 2 POWER SETTINGS.
C   ALX(19,22,2) ---- ARRAY CONTAINING 'AL'   PROFILE DATA FOR 19 ANGLES
C                     AND 22 PROFILE DISTANCES FOR 2 POWER SETTINGS.
C   ALTX(19,22,2) --- ARRAY CONTAINING 'ALT'  PROFILE DATA FOR 19 ANGLES
C                     AND 22 PROFILE DISTANCES FOR 2 POWER SETTINGS.
C   SENXD(19,22,4) --- ARRAY CONTAINING INTERPOLATED PROFILE DATE FOR
C                      PNL, PNLT, AL, AND ALT FOR 19 ANGLES AND 22
C                      DISTANCES.
C   IPRCK(6) --- PROGRAM FLAG SET EQUAL TO ONE WHEN THE CORRESPONDING
C                REFERENCE DATASET IS REQUIRED TO INTERPOLATE DATA.
C   DMY(202) --- DUMMY ARRAY USED BY SUBROUTINE 'PLT'.
C
C   THE FOLLOWING PARAMETERS ARE READ FROM THE NORMALIZED 'COMDECKS'
C   (REFERENCE DATASET) BY SUBROUTINE 'RSPLN':
C
C   RUN(6) --- 2 CHARACTER RUN NUMBER FOR EACH 'OPC'.
C   TEST(6) --- 10 CHARACTER TEST NUMBER FOR EACH 'OPC'.
C   FSPL(19,24,6) --- NORMALIZED SPL DATA FOR EACH 'OPC'.
C   PS(6,6) --- POWER SETTING DATA FOR EACH 'OPC'.
C   OPD(2,6) --- POWER DESCRIPTION DATA FOR EACH 'OPC' (20 CHARACTERS).
C   TT(6,6) --- TEST TITLE INFORMATION FOR EACH 'OPC'; 2 LINES OF
C               25 CHARACTERS; FIRST LINE IS THE AIRCRAFT NAME.
C
      DIMENSION SENX(19,22,12),IREQ(2,6),NR(17,3),TYPE(3),FREQ(24)
      COMMON M,MM,IL,IH,NC,L,N,ID,DIST,MEAS(3),FSPL(19,24,6),SPLX(19,24)
     1,PNLX(19,22,2),PNLTX(19,22,2),ALX(19,22,2),ALTX(19,22,2),
     2 SENXD(19,22,4),IR(19),IPRCK(6),DMY(202)
      COMMON /ATTNC/ ATNC(24),ATN8(24),SX(22)
      COMMON /HEADC/ TEST(6),TT(6,6),DATE,RUN(6),IPAGE,IVER,ACC,OPC(6),
     1 IT,P1,IHH,IT8,P8,IH8,FIMPRS,PV,CRI,PS(6,6),OPD(2,6),OPCC(6),DELN
     2, PSC(6),PSU,NP,PSIF(6),PSCF(6),NRC(6),ICC,OPCDM,OPD1,OPD2
     3,COMD(6),RUNC(6),IC,DATN(6),IFC(6),IFCC,IFI(6),IFII
      EQUIVALENCE (PNLX(1,1,1),SENX(1,1,1)),(SPLX(1,1),NR(1,1))
      DATA BLK/1H /,ASK/1H*/
C   PREFERRED BAND CENTER FREQUENCY DATA IN 'HZ' (USED FOR PRINTOUT ONLY)
      DATA FREQ / 8H   50    ,8H   63    ,8H   80    ,8H  100    ,8H  125
     3,8H  160    ,8H  200    ,8H  250    ,8H  315    ,8H  400    ,8H  500
     4,8H  630    ,8H  800    ,8H 1000    ,8H 1250    ,8H 1600    ,8H 2000
     5,8H 2500    ,8H 3150    ,8H 4000    ,8H 5000    ,8H 6300    ,8H 8000
     6,8H10000    /,IVER/1/,DELN/0.0/,ACC/1H /,NN/6/,NPM/6/,IRD/2/
     7,TYPE/5HPNLT:,5HAL:  ,5HALT: /,DFMXER/5.0/
     8,RUNC/2H01,2H02,2H03,2H04,2H05,2H06/,ASK3/3H***/
      IL=1
      IH=24
      M=3
      MM=1
      NC=19
      DIST=250.0
C   COMPUTE STANDARD DISTANCE DATA USED TO COMPUTE PROFILE DATA.
      DO 5 I=1,22
      FN=FLOAT(I+22)*0.1
```

```
    5 SX(I)=10.0**FN
C   READ DATE IN FORM: 12 APR 77
C   READ 'JOB CONTROL CARD'
       READ(5,1060) DATE,IPR,IEDIT,MEAS,FMXER
       IF (FMXER .LT. 0.01) FMXER=DFMXER
       IF (MEAS(1)+MEAS(2)+MEAS(3)) 6,6,10
C   IF ALL MEAS(I)=0, COMPUTE ALL 3 MEASURES.
    6 DO 7 I=1,3
    7 MEAS(I)=1
C   INITIALIZE CODE SHEET PARAMETERS:
   10 DO 15 I=1,NPM
       OPCC(I)=BLK
       IFC(I)=0
   15 PSC(I)=BLK
       DELND=DELN
       DACC=ACC
C   CALL SUBROUTINE 'TESTN' TO READ CODE SHEET PARAMETERS FOR AIRCRAFT
C   TO BE ANALYZED:
       CALL TESTN(NPM)
C   IF ACC=ASK, JOB WILL BE TERMINATED.
       IF (ACC     .EQ. ASK) GO TO 999
C   IF ACC=***, NO NEW NORMALIZED REFERENCE DATA ARE READ UNLESS
C   'IFCC'>'IFII'; DATA FROM THE PREVIOUS SET WILL BE USED BELOW.
C   IFCC --- NUMBER OF SPECIAL CASE (NO INTERPOLATION PERMITTED) POWER
C             SETTINGS.
       IF (ACC .NE. ASK3) GO TO 25
       ACC=DACC
       IF (IFCC .LE. IFII) GO TO 35
C   INITIALIZE REFERENCE FILE PARAMETERS:
   25 DELND=0.0
       DO 30 I=1,NN
       PS(1,I)=BLK
       PS(2,I)=BLK
       OPC(I)=BLK
       TEST(I)=BLK
       IFI(I)=0
   30 RUN(I)=BLK
C   CALL SUBROUTINE 'RSPLN' TO READ THE NORMALIZED DATASETS:
       CALL RSPLN(NN,IERR)
       IF (IERR) 35,35,10
   35 IF (NP .GT. 0) GO TO 45
C   FOR NP=0, COMPUTE THE PROFILE DATA FOR ALL REFERENCE FILE POWER
C   CONDITIONS; INITIALIZE THE REQUIRED 'ID' ARRAYS HERE:
       NP=N
       PSU=PS(2,1)
       IFCC=IFII
       DO 40 I=1,N
       PSC(I)=PS(1,I)
       NRC(I)=I
       IREQ(1,I)=I
       IREQ(2,I)=0
       IFC(I)=IFI(I)
   40 OPCC(I)=OPC(I)
       GO TO 50
C   CALL SUBROUTINE 'RANK' TO DETERMINE THE INDICIES OF THE REFERENCE
```

```
C  DATA REQUIRED TO INTERPOLATE EACH OUTPUT POWER SETTING; STORE THE
C  INDICIES IN ARRAY 'IREQ':
   45 CALL RANK(IREQ,IERR)
      IF (IERR) 50,50,10
   50 IPAGE=0
C  CALL SUBROUTINE 'TITPG' TO PRINT COVER PAGE:
      IF (IPR .GT. 0) CALL TITPG
C  CALL SUBROUTINE 'SUMRY' TO PRINT THE SUMMARY PAGE:
      CALL SUMRY(IREQ,IEDIT,FMXER)
C  'D1' IS A CONSTANT USED IN SUBROUTINE 'CDIST' TO COMPUTE 'SPL' DATA
C  AT STANDARD PROFILE DISTANCES:
      D1=10.0*ALOG10(FIMPR8)+20.0*ALOG10(DIST)
C  DEFINE FLAG 'IPRCK' AS FOLLOWS:
C  IPRCK(L)=0 --- L-TH REFERENCE DATASET NOT USED IN COMPUTATIONS.
C  IPRCK(L)=1 --- L-TH REFERENCE DATASET IS USED IN COMPUTATIONS.
      DO 55 L=1,N
      IPRCK(L)=0
      DO 55 IC=1,NP
      IF (IREQ(1,IC) .EQ. L) IPRCK(L)=1
      IF (IREQ(2,IC) .EQ. L) IPRCK(L)=1
   55 CONTINUE
C  DELND IS ALWAYS 0.0 FOR THE FIRST SET OF DATA FOR EACH 'ACC':
      D=DELN-DELND
      IF (ABS(D) .LT. .001) GO TO 70
C  ADD 'DELN' TO THE REFERENCE SPL DATA:
      DO 65 L=1,N
      IF (IPRCK(L)) 65,65,58
   58 DO 60 I=1,NC
      DO 60 J=IL,IH
   60 FSPL(I,J,L)=FSPL(I,J,L)+D
   65 CONTINUE
   70 IF (IPR) 160,160,80
C  SET UP AND PRINT THE NORMALIZED REFERENCE DATA PAGES:
   80 ID=ICV(DIST)
      DO 150 L=1,N
      IF (IPRCK(L)) 150,150,85
   85 IPAGE=IPAGE+1
C  PRINT NORMALIZED DATA PAGE HEADING:
      CALL HEADS(1)
C  PRINT NORMALIZED 'SPL' DATA:
      DO 100 J=IL,IH,MM
      DO 90 I=1,NC
C  CONVERT ARRAY 'FSPL(I,J,L)' DATA TO INTEGER VALUE.
      IR(I)=ICV(FSPL(I,J,L))
   90 CONTINUE
      WRITE(6,2200) FREQ(J),IR
  100 CONTINUE
      DO 120 I=1,NC
      D=0.0
      DO 110 J=IL,IH,MM
      D=D+10.0**(FSPL(I,J,L)/10.0)
  110 CONTINUE
C  'D' IS THE OVERALL SOUND PRESSURE LEVEL:
      D     =10.0*ALOG10(D)
      IR(I)=ICV(D)
```

```
  120 CONTINUE
      WRITE(6,2150)
C  PRINT OVERALL 'SPL':
      WRITE(6,2100) IR
      WRITE(6,2005)
  150 CONTINUE
  160 IPAGE=0
C  LABEL 500 LOOP --- COMPUTE THE PROFILE DATA FOR EACH OF THE 'NP'
C                     POWER SETTINGS (PSC):
      DO 500 IC=1,NP
      IPAGE=IPAGE+1
      ICC=NRC(IC)
      IC1=IC-1
C  LABEL 300 LOOP --- COMPUTE THE PROFILE DATA FOR THE REFERENCE
C                     POWER CONDITIONS REQUIRED TO INTERPOLATE THE
C                     PSC(IC) PROFILE DATA; THESE DATA MAY HAVE BEEN
C                     COMPUTED FOR A PREVIOUS 'PSC':
      DO 300 II=1,2
      L=IREQ(II,IC)
      IF (L) 300,300,200
  200 IF (IC .EQ. 1) GO TO 250
      IF (L .EQ. IREQ(II,IC1)) GO TO 300
C  CALL SUBROUTINE 'CDIST' TO CONTROL THE COMPUTATION AND PRINTOUT OF
C  THE PROFILE DATASET COMPUTATIONS:
C  IRD IS THE INDEX OF THE STANDARD DISTANCE SET, SX(I), CORRESPONDING
C  TO THE REFERENCE DISTANCE, DIST.
  250 CALL CDIST(IRD,D1,II)
  300 CONTINUE
C  AFTER LABEL 300 THE PROFILE DATA REQUIRED TO INTERPOLATE THE DATA
C  FOR PSC(IC) IS STORED IN ARRAY SENX(19,22,12):
      L1=IREQ(1,IC)
      L2=IREQ(2,IC)
      IF (L1 .GT. 0 .AND. L2 .GT. 0) GO TO 320
      JI=2
      IF (L1) 310,310,370
  310 IF (L2) 500,500,380
C  'ICC' IS THE INDEX OF ARRAY 'PSCF' OF RANK 'IC'.
C  'L1' AND 'L2' ARE INDICIES OF ARRAY 'PSIF' FOR DATA TO BE
C  INTERPOLATED.
  320 J=8
      JJ1=1
      IF (IPR .GT. 0 .AND. MEAS(1) .GT. 0) GO TO 315
      J=9
      JJ1=3
C  LABEL 350 LOOP --- INTERPOLATE PROFILE DATA FOR 'PSC(IC)':
  315 DO 350 JJ=JJ1,7,2
      J2=(JJ-1)/2
C  J2=0 FOR 'PNL' DATA:
      IF (J2) 330,330,335
C  SET UP DISTANCE INDICIES FOR ALL 22 DISTANCES:
  330 K1=1
      K2=22
      GO TO 345
  335 IF (MEAS(J2)) 340,340,330
C  COMPUTE THE PROFILE DATA FOR THE REFERENCE DISTANCE ONLY:
```

```
  340 K1=IRD
      K2=IRD
  345 J=J+1
      J1=JJ+1
C  INTERPOLATE PROFILE DATA FOR EACH DISTANCE AND ANGLE:
      DO 350 K=K1,K2
      DO 350 I=1,19
  350 SENX(I,K,J)=((SENX(I,K,J1)-SENX(I,K,JJ))/(PSIF(L2)-PSIF(L1)))
     1*(PSCF(ICC)-PSIF(L1))+SENX(I,K,JJ)
C  ARRAY 'SENX(I,K,J)' FOR J=9,12 CONTAINS THE PNLX(19,22) TO
C  ALTX(19,22) DATA AS REQUESTED.
      L=0
      JI=1
      J1=10
      J2=12
      GO TO 400
C  LABEL 370--NO INTERPOLATION--PNLT, AL AND ALT STORED IN SENX(I,K,J)
C  FOR J=3,5 AND 7.
  370 J1=3
      J2=7
      L=L1
      GO TO 400
C  LABEL 380--NO INTERPOLATION--PNLT, AL AND ALT STOTED IN SENX(I,K,J)
C  FOR J=4,6 AND 8.
  380 J1=4
      J2=8
      L=L2
  400 IF (IEDIT) 440,430,440
C  CALL SUBROUTINE 'EDIT' TO SELECT THE 10 ANGLES WHICH BEST DEFINE THE
C  PROFILE DATA AT THE REFERENCE DISTANCE:
  430 CALL EDIT(IRD,J1,J2,JI,ACC,PSC(ICC),PSU,FMXER)
C  IF 'NR(I,J)'>9  FOR I= ANGLES 10 TO 170 AND J= MEASURE INDEX,
C  THEN THE I-TH ANGLE IS INCLUDED IN THE PROFILE DATASET FOR THE J-TH
C  MEASURE.
C  CALL SUBROUTINE 'PPFDAT' TO WRITE THE 'PNLT', 'AL' AND/OR 'ALT'
C  PROFILE DATASETS ON FILE 'TAPE2' AND PRINT THE TAB LISTING ON THE
C  OUTPUT FILE (TAPE6):
  440 CALL PPFDAT(J1,J2,JI,L1,L2,IPR,IEDIT)
C  CALL SUBROUTINE 'PLT' TO PRINT A TAB PLOT OF ANGLE VERSUS NOISE LEVEL
C  FOR 'PNLT', 'AL' AND 'ALT' PROFILE DATA FOR THE REFERENCE DISTANCE:
      IF (IPR) 500,500,450
  450 CALL PLT(IRD,J1,J2,JI)
      WRITE(6,2500)
C  LABEL 490 LOOP --- LIST, BELOW THE TAB PLOT, ALL ANGLES FOR WHICH
C                     PROFILE DATA WERE WRITTEN ON FILE 'TAPE2':
      DO 490 J=1,3
      IF (IEDIT) 460,470,480
  460 WRITE(6,2510) TYPE(J)
      GO TO 490
  470 IF (MEAS(J)) 460,460,475
  475 WRITE(6,2520) TYPE(J),(NR(I,J),I=1,8)
      GO TO 490
  480 IF (MEAS(J)) 460,460,485
  485 WRITE(6,2530) TYPE(J)
  490 CONTINUE
```

```
  500 CONTINUE
      GO TO 10
  999 WRITE(6,2400)
      STOP
C*************************************************************************
C*************************************************************************
 1060 FORMAT(A10,5I2,F5.0)
 2005 FORMAT(     12X,1H(,110(1H-),1H))
 2100 FORMAT(12X,*(    OVERALL*,3X,19I5,*  )*)
 2150 FORMAT(12X,*(*,110X,*)*)
 2200 FORMAT(12X,*(*, 3X,A8, 2X,19I5,*  )*)
 2400 FORMAT(*1  END OF OMEGA11 JOB*)
 2500 FORMAT(//5X,*PROFILE DATA WRITTEN ON FILE 'TAPE2' AS FOLLOWS:*)
 2510 FORMAT(5X,A5,2X,*NO DATA WRITTEN*)
 2520 FORMAT(5X,A5,2X,*DATA FOR ANGLES:  0*,8I4,* 180*)
 2530 FORMAT(5X,A5,2X,*DATA FOR ALL 19 ANGLES*)
C*************************************************************************
C*************************************************************************
      END
```

```
      SUBROUTINE TESTN(NPM)
C*********************************************************************
C*********************************************************************
C
C     DECK 1   SUBROUTINE 'TESTN'
C     THIS SUBROUTINE IS CALLED FROM THE 'OMEGA11' MAIN DECK TO INPUT THE
C     TEST PARAMETER DATA.
C
C     MOST TEST PARAMETERS ARE DEFINED BY THIS SUBROUTINE.
C
C*********************************************************************
C*********************************************************************
      DIMENSION ATN(24),OPCCD(6)
      COMMON  M,MM,IL,IH,NC,L,N,ID,DIST
      COMMON /ATTNC/ ATNC(24),ATN8(24),SX(22)
      COMMON /HEADC/ TEST(6),TT(6,6),DATE,RUN(6),IPAGE,IVER,ACC,OPC(6),
     1 IT,P1,IHH,IT8,P8,IH8,FIMPR6,PV,CRI,PS(6,6),OPD(2,6),OPCC(6),DELN
     2, PSC(6),PSU,NP,PSIF(6),PSCF(6),NRC(6),ICC,OPCDM,OPD1,OPD2
     3,COMD(6),RUNC(6),IC,DATN(6),IFC(6),IFCC,IFI(6),IFII
C     ARRAY 'ATN'    CONTAINS THE ABSORPTION COEFFICIENTS FOR STANDARD DAY
C     CONDITIONS (59 F AND 70 %).
C     ATN(1) --> ATN(24)---1/3 OCTAVE VALUES FOR BANDS 17 TO 40.
      DATA   ATN/0.07,0.09,0.11,0.14,0.18,0.23,0.29,0.36,0.45,0.58,0.73,
     1  0.92,1.17,1.47,1.85,2.39,3.05,4.02,5.44,7.63,9.01,12.75,18.54,
     2  27.15/,ASK/1H*/,W/1HW/,ZERO/1H0/,BLK/1H /
     3,OPCCD/2H91,2H92,2H93,2H94,2H95,2H96/
C*********************************************************************
C          PARAMETERS SET BY THIS SUBROUTINE
C*********************************************************************
C     NP--- NUMBER OF OPERATION POWER CODES TO BE PROCESSED FOR THIS 'ACC'.
C     ACC --- AIRCRAFT CODE
C     CRI --- COMDECK REVISION ID
C     PV --- PROFILE VERSION CODE
C     IT8, P8, IH8 --- TEMPERATURE, PRESSURE AND RELATIVE HUMIDITY
C                      FOR PROFILE DATASET OUTPUT (F, IN HG, %)
C     IT,  P1, IHH --- TEMPERATURE, PRESSURE AND RELATIVE HUMIDITY
C                      FOR STANDARD CONDITIONS   (F, IN HG, %)
C     OPCC(6) --- ARRAY CONTAINING THE OPERATION POWER CODES FOR DATA TO BE
C                 PROCESSED FOR AIRCRAFT CODE 'ACC'.
C     DELN    --- VARIABLE CONTAINING 'DELTA N' DATA FOR AIRCRAFT 'ACC'.
C     PSU --- POWER SETTING UNITS FOR PROFILE DATA; EG., % RPM
C     PSC(6) --- POWER SETTING VALUES FOR WHICH DATA ARE TO BE PROCESSED
C                FOR AIRCRAFT 'ACC'.
C     IFC(6) --- FLAG ARRAY SET EQUAL TO 1 FOR SPECIAL CASE POWER SETTINGS
C                (NO INTERPOLATION PERMITTED).
C     IFCC --- NUMBER OF IFCC'S >0.
C     ATNC(24) --- ARRAY CONTAINING ATMOSPHERIC ABSORPTION COEFFICIENTS
C                  FOR NORMALIZED INPUT DATASET (STANDARD DAY CONDITIONS).
C     ATN8(24) --- ARRAY CONTAINING ATMOSPHERIC ABSORPTION COEFFICIENTS
C                  FOR PROFILE DATA WEATHER CONDITIONS.
C*********************************************************************
      EX=5.0/9.0
      IT=59
      P1=29.92
      IHH=70
```

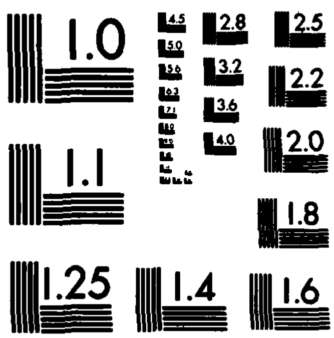
```
      TM=15.0
      IFCC=0
C  READ FIRST CODE SHEET CARD.
      READ(5,1000) ACC,IT8,P8,IH8,PV,CRI,DELN
C  AN END OF FILE ON UNIT 5 WILL TERMINATE THE JOB.
      IF (EOF(5)) 1,2
C  IF ACC=ASK, JOB WILL BE TERMINATED BY THE MAIN DECK.
    1 ACC=ASK
      RETURN
C  SET DEFAULT VALUES FOR 'PV', 'CRI', 'IT8', 'P8' AND 'IH8'.
    2 IF (PV .EQ. BLK) PV=W
      IF (CRI .EQ. BLK) CRI=ZERO
      IF (IT8 .LT. 1) IT8=59
      IF (IH8 .LT. 1) IH8=70
      IF (P8 .LT.0.1) P8=29.92
      IF (ABS(DELN) .LT. .001) DELN=0.0
      TM8=(FLOAT(IT8)-32.0)*EX
C  READ SECOND CODE SHEET CARD FOR AIRCRAFT 'ACC'.
      READ(5,1030) NP,PSU,(PSC(I),IFC(I),OPCC(I),I=1,NP)
      IF (NP .GT. NPM) GO TO 60
      IF (NP) 20,20,5
    5 DO 10 I=1,NP
      IF (OPCC(I) .EQ. BLK) OPCC(I)=OPCCD(I)
      IF (IFC(I) .GT. 0) IFCC=IFCC+1
C  IFCC COUNTS THE NUMBER OF A/B, WET, ETC. SPECIAL CASES.
   10 CONTINUE
C  'FIMPR8' IS THE IMPEDANCE RATIO FOR NORMALIZED AND PROFILE CONDITIONS
   20 FIMPR8=SQRT((273.0+TM)/(273.0+TM8))*P8/P1
      IF (IT8 .EQ. 59 .AND. IH8 .EQ. 70) GO TO 30
C  COMPUTE ATMOSPHERIC ABSORPTION COEFFICIENTS FOR PROFILE DATASET
C  CONDITIONS IF WEATHER IS NOT STANDARD DAY.
      CALL ALPH(FLOAT(IH8),FLOAT(IT8),ATN8,IL,IH)
      GO TO 35
C  ARRAY ATN(I) CONTAINS THE ATMOSPHERIC ABSORPTION DATA FOR STANDARD
C  DAY CONDITIONS.
   30 DO 32 I=1,24
   32 ATN8(I)=ATN(I)
   35 DO 40 I=1,24
   40 ATNC(I)=ATN(I)
      RETURN
   60 WRITE(6,2100) NP,NPM
   95 ACC=ASK
 1000 FORMAT(A3,2X,I5,F5.0,I5,1X,A1,1X,A1,1X,F5.0)
 1030 FORMAT(I1,A6,3X,7(A5,1X,I1,1X,A2))
 2100 FORMAT('1   TERMINATE JOB BECAUSE NP>NPM; NP=',I2,'   NPM=',I2)
      RETURN
      END
```

```
      SUBROUTINE ALPH(REL,TEMP,ABC,IL,IH)
C************************************************************************
C************************************************************************
C
C   DECK 2   SUBROUTINE 'ALPH'
C   THIS SUBROUTINE  CALLED FROM SUBROUTINE 'TESTN' COMPUTES THE
C   ATMOSPHERIC ABSORPTION COEFFICIENTS.
C
C   IN THIS SUBROUTINE, THE PROCEDURE USED TO CALCULATE THE COEFFICIENTS
C   OF ATMOSPHERIC ABSORPTION IS THE SAME AS DESCRIBED IN SAE ARP 866A.
C
C   SUBROUTINE ALPH(REL,TEMP,ABC,IL,IH)
C    WHERE.....
C      REL  - RELATIVE HUMIDITY IN PERCENT
C      TEMP - TEMPERATURE IN DEGREES FAHRENHEIT
C      ABC  - ARRAY CONTAINING THE COMPUTED COEFFICIENTS OF ATMOSPHERIC
C             ABSORPTION IN DB PER 1000 FEET
C      IL   - FIRST BAND FOR WHICH ABC IS COMPUTED
C      IH   - LAST BAND FOR WHICH ABC IS COMPUTED
C
C************************************************************************
C************************************************************************
      DIMENSION X(29),Y(29),           ABC(24), FREQ3(24)
      COMMON M,MM
      F(TEMP,REL)=0.01064764002*REL*10.0**(0.02268074*TEMP
     1-0.00009589*TEMP**2+0.0000003*TEMP**3)
      DATA FREQ3/50.0,63.0,80.0,100.0,125.0,160.0,200.0,250.0,315.0,
     A400.0,500.0,630.0,800.0,1000.0,1250.0,1600.0,2000.0,2500.0,3150.0,
     B4000.0,4476.0,5612.0,7096.0,8943.0/
      DATA X/0.0,0.25,0.50,0.6,0.7,0.8,0.9,1.0,1.1,1.2,1.3,1.5,1.7,2.0,
     A2.3,2.5,2.8,3.0,3.3,3.6,4.15,4.45,4.8,5.25,5.7,6.05,6.5,7.0,10.0/
      DATA Y/0.0,0.315,0.700,0.84,0.93,0.975,0.996,1.0,0.97,0.9,0.84,
     A0.75,0.67,0.57,0.495,0.45,0.4,0.37,0.33,0.3,0.26,0.245,0.23,0.22,
     B0.21,0.205,0.2,0.2,0.2/
      HA=F(TEMP,REL)
      FT1=0.003786785337*10.0**(0.004683333333*TEMP)
      FT2=2.4931591362E-8*10.0**(0.000633*TEMP)
      DO 100 J=IL,IH,MM
      FREQ=FREQ3(J)
      HMX=(FREQ/1010.0)**0.5
      HN=HA/HMX
      IF (HN-6.50) 30,20,20
   20 ALN=0.2
      GO TO 60
   30 IF (HN) 40,40,50
   40 ALN=0.0
      GO TO 60
   50 ALN=ATKN(X,Y,29,2,HN)
   60 ABC( J)=FREQ*FT1*ALN+FT2*(FREQ**2.05)
  100 CONTINUE
      RETURN
C************************************************************************
C   NOTE:
C      THE FOLLOWING F(TEMP,REL) IS THE SAME AS ABOVE:
C      F(TEMP,REL)=10.0**(ALOG10(REL)-1.97274654+0.02268074*TEMP
```

AD-A127 419 COMPUTER PROGRAMS FOR PRODUCING SINGLE-EVENT AIRCRAFT NOISE DATA FOR SPEC..(U) DAYTON UNIV OH RESEARCH INST H T MOHLMAN APR 83 UDR-TR-82-30 AFAMRL-TR-83-020 4/5

UNCLASSIFIED F33615-78-C-0500 F/G 9/2 NL

cont.



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

```
C    1-0.00009589*TEMP**2+0.0000003*TEMP**3)
C     ALMX=FT1*FREQ IS THE SAME AS THE FOLLOWING:
C     ALMX=10.0**(ALOG10(FREQ)-2.4215+0.281*TEMP/60.0)
C     FT2*(FREQ**2.05)  IS THE SAME AS THE FOLLOWING:
C     10.0**(2.05*ALOG10(FREQ/1000.0)+0.000633*TEMP-1.45325)
C     THE FOLLOWING TWO CARDS ARE REPLACED BY LABEL 60 IN THE PROGRAM:
C  60 ALM=ALMX*ALN
C     ABC(J)=ALM+10.0**(2.05*ALOG10(FREQ/1000.0)+0.000633*TEMP-1.45325)
C*******************************************************************
      END
```

```
      FUNCTION ATKN(X,Y,N,K,XI)
C*****************************************************************
C*****************************************************************
C
C  DECK 3   FUNCTION 'ATKN'
C  THIS FUNCTION IS CALLED ONLY FROM SUBROUTINE 'ALPH'.
C
C     ATKN      AITKEN INTERPOLATING FUNCTION
C
C     USAGE...
C
C     Z=ATKN(X,Y,N,K,XI)
C
C        WHERE...
C
C        X - TABLE OF INDEPENDENT VARIABLE VALUES,
C            (MUST BE INCREASING FOR THIS REVISED ATKN ROUTINE)
C        Y - TABLE OF DEPENDENT VARIABLE VALUES.
C        N - NO. OF POINTS IN TABLES X AND Y.
C        K - DEGREE OF INTERPOLATION DESIRED.
C        XI- X-VALUE FOR WHICH INTERPOLATION IS DESIRED.
C
C        THE INTEPOLATED VALUE IS RETURNED AS THE FUNCTION VALUE.
C
C*****************************************************************
C*****************************************************************
      DIMENSION   X(N), Y(N),XX(13),YY(13)
      DATA   KMAX/ 12/
C
      IF ( K .GT. KMAX .OR. K .LE. 0 )     GO TO 300
C
      K1=K+1
   10 IF (XI-X(1)) 20,20,30
   20 LL=0
      GO TO 200
   30 IF (X(N)-XI) 40,40,50
   40 LL=N-K1
      GO TO 200
   50 LL=1
      LU=N
   60 IF (LU-LL-1) 180,180,70
   70 LI=(LL+LU)/2
      IF (X(LI)-XI) 80,80,90
   80 LL=LI
      GO TO 60
   90 LU=LI
      GO TO 60
  180 LL=LL-(K1+1)/2
C
      IF (LL) 20,200,190
  190 IF (LL+K1-N) 200,200,40
  200 DO 210 I=1,K1
      I1=LL+I
      XX(I)=X(I1)-XI
  210 YY(I)=Y(I1)
```

```
      DO 220 I=1,K
      DO 220 J=I,K
  220 YY(J+1)=(1./(XX(J+1)-XX(I)))*(YY(I)*XX(J+1)-YY(J+1)*XX(I))
      ATKN=YY(K1)
      RETURN
C
 300  PRINT 1000, K
 1000 FORMAT (3H0K=,I12,33H   IS INCORRECT FOR FUNCTION ATKN)
      CALL SYSTEM(200,0)
      END
```

```
      SUBROUTINE HEADS(IPH)
C*************************************************************************
C*************************************************************************
C
C  DECK 4   HEADS---PRINTS PAGE HEADINGS
C  THIS SUBROUTINE CALLED FROM ROUTINES 'OMEGA11',         'CDIST' AND
C  'PLT' PRINTS THE BLOCK HEADINGS AT THE TOP OF ALL OUTPUT PAGES.
C
C  THE PAGE HEADING BLOCKS ARE EITHER 112 CHARACTERS WIDE (FORMAT LABELS
C  2000 ETC.) OR 126 CHARACTERS WIDE (PROFILE DATA; LABELS 3000 ETC).
C
C  'IPH' IS THE PAGE HEADING CODE.
C
C*************************************************************************
C*************************************************************************
      DIMENSION S1C(6),PAGE( 6),PAG(15),
     1   S17(4),S18(2),S19(5)
      COMMON  M,IDM(3),NC,L,N,ID
      COMMON /HEADC/ TEST(6),TT(6,6),DATE,RUN(6),IPAGE,IVER,ACC,OPC(6),
     1 IT,P1,IHH,IT8,P8,IH8,FIMPR3,PV,CR1,PS(6,6),OPD(2,6),OPCC(6),DELN
     2, PSC(6),PSU,NP,PSIF(6),PSCF(6),NRC(6),ICC,OPCDM,OPD1,OPD2
     3,COMD(6),RUNC(6),IC,DATN(6),IFC(6),IFCC,IFI(6),IFII
      DATA                      S17/8HPERCEIVE,8HD NOISE ,8HLEVEL (P,
     2 4HNDB)/,  S18/8HTONE-COR,8HRECTED, /,  S19/ 8HA-WEIGHT,8HED OVERA
     3,  8HLL SOUND, 8H LEVEL (, 4HDBA)/    ,
     4      S1C/8HNOISE LE,8HVEL AS A,8H FUNCTIO,8HN OF ANG,8HLE AROUN,
     5 8HD SOURCE/,BLK/1H /,PAGE/1HC,1HD,1HE,1HF,1HG,1HJ/
      DATA PAG/2H1 ,2H2 ,2H3 ,2H4 ,2H5 ,2H6 ,2H7 ,2H8 ,2H9 ,2H10,2H11,
     12H12,2H13,2H14,2H15/
      IP=IPH
      IF (IP-1) 1,1,5
    1 WRITE(6,2000)
      GO TO 20
    5 WRITE(6,3000)
      GO TO (20,50,60,70,80,55),IP
C  PRINT NORMALIZED DATA:
   20 WRITE(6,2010)
      GO TO 150
C  PRINT 'PNL' PROFILE DATA PAGE:
   50 WRITE(6,3010) S17,BLK,BLK,BLK
      GO TO 100
C  PRINT 'PNLT', 'AL' AND 'ALT' PLOT PAGE:
   55 WRITE(6,3010) S1C,BLK
      WRITE(6,3100) IVER
      WRITE(6,3210) ID,TEST(1)
      GO TO 102
C  PRINT 'PNLT' PROFILE DATA PAGE:
   60 WRITE(6,3010) S18,S17,BLK
      GO TO 100
C  PRINT 'AL'   PROFILE DATA PAGE:
   70 WRITE(6,3010) S19,BLK,BLK
      GO TO 100
C  PRINT 'ALT'  PROFILE DATA PAGE:
   80 WRITE(6,3010) S18,S19
      GO TO 100
```

```
C  LABELS 100 TO 115 ---> PRINT THE REMAINDER OF THE HEADING BLOCK FOR
C  THE PROFILE DATA:
  100 WRITE(6,3100) IVER
      WRITE(6,3200)  TEST(1)
  102 WRITE(6,3300) RUNC(IC),ACC
      WRITE(6,3400) (TT(I,1),I=1,3),OPD1,OPD2,IT8,OPCOM
     1,             (TT(I,1),I=4,5),PSC(ICC),PSU,P8,PV
      IF (L) 105,105,110
  105 WRITE(6,3500) BLK,BLK,IH8,DATE
      WRITE(6,3520) BLK,BLK,                    PAGE(IP),PAG(IPAGE)
      GO TO 115
  110 WRITE(6,3500) PS(3,L),PS(4,L),IH8,DATE
      WRITE(6,3520) PS(5,L),PS(5,L),PAGE(IP),PAG(IPAGE)
  115 WRITE(6,3015)
      IF (IP .EQ.  6) GO TO 999
      WRITE(6,3030)      (I,I=10,180,10)
      WRITE(6,3005)
      GO TO 999
C  LABELS 160 TO 500 ---> PRINT THE REMAINDER OF THE HEADING BLOCK FOR
C  112 CHARACTER HEADINGS:
  150 WRITE(6,2100) IVER
      WRITE(6,2200) ID,TEST(1)
      WRITE(6,2300) BLK,ACC
C  PRINT REFERENCE (NORMALIZED) WEATHER DATA:
      WRITE(6,2400) (TT(I,1),I=1,3),OPD(1,L),OPD(2,L),IT, OPC(L),
     1              (TT(I,1),I=4,5),PS(1,L),PS(2,L),P1,PV
      WRITE(6,2505) PS(3,L),PS(4,L),IHH,DATE
      WRITE(6,2510) PS(5,L),PS(6,L),DELN,PAGE(IP),PAG(IPAGE)
      WRITE(6,2015)
      WRITE(6,2030)      (I,I=10,180,10)
      GO TO 900
  900 WRITE(6,2005)
  999 RETURN
 2000 FORMAT(1H1,11X,1H(,110(1H-),1H))
 2005 FORMAT(12X,1H(,110X,1H))
 2010 FORMAT(12X,*( TABLE:   NORMALIZED SOUND PRESSURE LEVEL (DB)*,41X,
     1 *)IDENTIFICATION:*,7X,*)*)
 2015 FORMAT(     12X,1H(,110(1H-),1H))
 2030 FORMAT(12X,*( BAND CENTER*,    41X,*ANGLE (DEGREES)* ,42X,*)*/
     112X,*(  FREQ (HZ) *,5X,1H0,18I5,*   )*)
 2100 FORMAT(12X,*(*,10X,*1/3 OCTAVE BAND*,62X,*) OMEGA 11.*,I1,11X,*)*)
 2200 FORMAT(12X,*(*,10X,*DISTANCE =*,I5,* FEET   *,55X,*) TEST *,A10,
     1     6X,*)*)
 2300 FORMAT(12X,*(*,87(1H-),*) RUN  *,A2,14X,*)*/     12X,*( NOISE SOUR
     1CE/SUBJECT:*,7X,    *( OPERATION:*,18X,*) METEOROLOGY(*,14X,
     2 *) AIRCRAFT  CODE *,A3,3X,*)*)
 2400 FORMAT(12X,*(*, 3X,2A9, A7, 1X,*(*, 3X,2A10,5X,* )*,3X,*TEMP*,6X,
     1*=*,I5,* F*, 6X,*) OPERATION CODE *,A2,3X,* )*/ 12X,*(*, 3X,2A9,A7
     2,  1X,*(*, 3X,2A6,13X,* )*, 3X,*BAR PRESS =*, F5.2,* IN HG* , 2X,
     3*) PROFILE VERSION  *,A1,*    )*)
 2505 FORMAT(12X,*(*, 29X,              *(*, 3X,2A6,13X,* )*, 3X,*REL HUMID
     1 =*,I5,* %*, 6X,*) *,A10,11X,*)*)
 2510 FORMAT(12X,1H(,29X,1H(,3X,2A6,13X, 12H ) DELTA N =, F6.1, 3H DB,
     1 8X,6H) PAGE  ,A1,A2,12X,1H))
 3000 FORMAT(1H1, 4X,1H(,124(1H-),1H))
```

```
3005 FORMAT( 5X,1H(,124X,1H))
3010 FORMAT( 5X,*( TABLE:    *, 7A8,35X,*)IDENTIFICATION:*,7X,*)*)
3015 FORMAT(      5X,1H(,124(1H-),1H))
3030 FORMAT( 5X,*( DISTANCE*, 51X,*ANGLE (DEGREES)*, 49X,*)*/
   1 5X,*(   (FEET)*, 5X,*0*, 18I6,*   )*)
3100 FORMAT( 5X,*(*,          101X,*) OMEGA 11.*,I1,11X,*)*)
3200 FORMAT( 5X,*(*,10X, *AS A FUNCTION OF ANGLE AND DISTANCE FROM SOUR
   1CE*,44X,*) TEST *,A10,       6X,*)*)
3210 FORMAT( 5X,1H(,10X,10HDISTANCE =,I5,5H FEET,71X,*) TEST *,A10,
   1     6X,*)*)
3300 FORMAT(5X,*(*,101(1H-),*) RUN  *,A2,14X,*)*/       5X,*( NOISE SOUR
   1CE/SUBJECT:*,11X,  *( OPERATION:*,22X,*) METEOROLOGY:*,20X,
   2 *) AIRCRAFT  CODE *,A3,3X,*)*)
3400 FORMAT( 5X,*(*, 5X,2A9,A7,  3X,*(*,5X,2A10,   8X,*)* 5X,*TEMP*,6X,
   1*=*,I5,* F*,10X,*) OPERATION CODE *,A2,3X,* )*/  5X,*(*, 5X,2A9,A7
   2,  3X,*(*, 5X,2A6,16X,   *)*, 5X,*BAR PRESS =*, F5.2,* IN HG* ,6X,
   3*) PROFILE VERSION  *,A1,*    )*)
3500 FORMAT( 5X,*(*, 33X,            *(*, 5X,2A6,16X,   *)*, 5X,*REL HUMID
   1 =*,I5,* %*,10X,*) *,A10,11X,*)*)
3520 FORMAT(5X, *(*,33X,*(*, 5X,2A6,16X,   *)*,33X,
   1  *) PAGE  *,A1,A2,12X,*)*)
    END
```

```
      SUBROUTINE RSPLN(NN,IERR)
C*********************************************************************
C*********************************************************************
C
C  DECK 5   RSPLN---READ SPL INPUT
C  THIS SUBROUTINE IS CALLED FROM THE 'OMEGA11' ROUTINE TO INPUT THE
C  NORMALIZED DATASETS FROM FILE 'TAPE7' FOR N OPERATION POWER CODES.
C
C  EACH NORMALIZED DATASET CONTAINS THE FOLLOWING CARD TYPES:
C     (1) ONE 'COMDECK' NAME CARD (OPTIONAL--DEPENDS ON THE TYPE OF
C         UPDATE RUN USED TO CREATE THE REFERENCE FILE).
C     (2) THREE COMMENT CARDS WHICH IDENTIFY THE NORMALIZED DATA.
C     (3) THIRTY-EIGHT SPL DATA CARDS -- 2 PER ANGLE FOR 19 ANGLES.
C
C  THE NORMALIZED DATASET CARD FORMAT IS DESCRIBED IN THE WRITE-UP
C  ENTITLED "CARD FORMAT FOR GROUND RUN-UP NOISE NORMALIZED DATASETS".
C
C  THESE DATASETS WERE WRITTEN BY THE OMEGA 8 PROGRAM.
C
C---------------------------------------------------------------------
C
C  CARD FORMAT FOR THE SPL DATA:
C     THE DATASET NUMBER IS IN COLUMNS 1 TO 12 OF EACH CARD.  THE CARD
C     SEQUENCE NUMBER IS IN COLUMNS 13 TO 15.  COLUMNS 16 TO 20
C     CONTAIN THE ANGLE AT WHICH THE DATA WERE COLLECTED.
C     THE SPL POINTS (XXX.X) ARE STORED AS FOUR DIGIT INTEGERS IN
C     COLUMNS 21 TO 60 ON A MAXIMUM OF 2 CARDS PER SPECTRUM.
C
C*********************************************************************
C*********************************************************************
C  ARRAY OPCSP CONTAINS SPECIAL CASE OPC'S FOR AFTERBURNER, WET OR WITH
C  JETS WHICH MAY NOT BE INTERPOLATED.
C  NOPCSP=DIMENSION OF ARRAY 'OPCSP'.
      DIMENSION OPCSP(8)
      COMMON M,MM,IL,IH,NC,L,N,ID,DIST,MEAS(3),FSPL(19,24,6)
      COMMON /HEADC/ TEST(6),TT(6,6),DATE,RUN(6),IPAGE,IVER,ACC,OPC(6),
     1 IT,P1,IHM,IT8,P8,IH8,FIMPR8,PV,CRI,PS(6,6),OPD(2,6),OPCC(6),DELN
     2, PSC(6),PSU,NP,PSIF(6),PSCF(6),NRC(6),ICC,OPCOM,OPD1,OPD2
     3, COMD(6),RUNC(6),IC,DATN(6),IFC(6),IFCC,IFI(6),IFII
      DATA OPCSP/2H01,2H02,2H03,2H10,2H35,2H38,2H42,2H49/
      DATA  NOPCSP/8/,ASK/1H*/,ICOM/1/
C  'ICOM' IS DEFINED AS FOLLOWS AFTER THE FIRST DATASET IS READ FROM
C  FILE 'TAPE7' (INITIALLY 'ICOM'=1):
C  ICOM=1 --- 'COMDECK' CARD IS PART OF THE NORMALIZED DATASET.
C  ICOM=0 --- 'COMDECK' CARD IS NOT PART OF THE NORMALIZED DATASET.
      IERR=0
      IFII=0
      N=0
      REWIND 7
      IF (ICOM) 15,15,5
C  READ 'COMDECK' OR FIRST 'COMMENT' CARD (CD CHECKS CARD TYPE):
    5 READ(7,1010) CD,DACC,DOPC,DDATN,DTEST,DRUN
      IF (EOF(7)) 120,10
C  FOR 'CD=ASK' , THE 'COMDECK' NAME CARDS ARE IN THE REFERENCE FILE:
   10 IF (CD .EQ. ASK) GO TO 15
```

```
      ICOM=0
      GO TO 20
C   READ FIRST 'COMMENT' CARD:
   15 READ(7,1010) CD,DACC,DOPC,DDATN,DTEST,DRUN
      IF (EOF(7)) 120,20
   20 IF (DACC .EQ. ACC) GO TO 50
C   READ THROUGH THIS NORMALIZED DATA DECK (40 CARDS).
      DO 25 I=1,40
   25 READ(7,1010) CD
      IF (ICOM) 15,15,30
C   READ 'COMDECK' CARD:
   30 READ(7,1010) CD
      GO TO 15
C   DATA FOR AIRCRAFT 'ACC' WAS FOUND IN THE REFERENCE FILE:
   35 IF (N) 50,50,40
   40 DO 45 L=1,N
C   FOR 'DOPC=OPC(L)', THIS IS AT LEAST THE SECOND DATASET WITH THIS
C   OPC(L):
      IF (DOPC .EQ. OPC(L)) GO TO 68
   45 CONTINUE
   50 N=N+1
      L=N
      DO 52 I=1,NOPCSP
C   CHECK FOR SPECIAL CASE DATA:
      IF (DOPC .EQ. OPCSP(I)) GO TO 54
   52 CONTINUE
      IF (N .GT. NN) GO TO 150
      GO TO 64
   54 IF (IFCC .GT. 0 .OR. NP .LE. 0) GO TO 60
      N=N-1
      L=N
C   READ THROUGH THIS NORMALIZED DATA DECK (40 CARDS).
      DO 58 I=1,40
   58 READ(7,1010) CD
      GO TO 75
   60 IF (N .GT. NN) GO TO 150
C   SET AND INCREMENT SPECIAL CASE FLAGS:
      IFI(L)=1
      IFII=IFII+1
C   SET THE TEST PARAMETER FOR THE L-TH POWER CONDITION (L-TH OPC):
   64 OPC(L)=DOPC
   68 TEST(L)=DTEST
      RUN(L)=DRUN
      DATN(L)=DDATN
C   READ SECOND 'COMMENT' CARD:
      READ(7,1020) COND(L),(TT(I,L),I=1,6)
C   READ THIRD 'COMMENT' CARD:
      READ(7,1030) OPD(1,L),OPD(2,L),(PS(I,L),I=1,6)
C   READ 'SPL' DATA FOR 'NC' ANGLES--NC=19 HERE:
      DO 70 I=1,NC
C   COMPUTE COLUMN ID: ICHO.
      ICHO=(I-1)*10
      READ(7,1000) ICH,(FSPL(I,J,L),J=IL,IH,MM)
C   CHECK COLUMN ID:
      IF (ICH .NE. ICHO) IERR=1
```

```
   70 CONTINUE
      IF (IERR) 75,75,250
   75 IF (ICOM) 85,85,80
C  READ 'COMDECK' CARD:
   80 READ(7,1010) CD
      IF (EOF(7)) 100,85
   85 READ(7,1010) CD,DACC,DOPC,DDATN,DTEST,DRUN
C  FOR DACC NOT EQUAL TO ACC, ASSUME THAT ALL DATA FOR 'ACC' HAVE
C  BEEN READ:
      IF (EOF(7)) 100,90
   90 IF (DACC .EQ. ACC) GO TO 85
  100 IF (IFCC .GT. 0 .AND. IFI1 .LE. 0) GO TO 200
      RETURN
C  ************  ERROR MESSAGES **************
  120 WRITE(6,3100) ACC
      IERR=2
      RETURN
  150 WRITE(6,3000) NN,ACC,NN
      IERR=3
      RETURN
  200 WRITE(6,3200) ACC
      IERR=4
      RETURN
  250 WRITE(6,2000) ACC
  300 RETURN
 1000 FORMAT(15X,I5,15F4.1/20X,15F4.1)
 1010 FORMAT(A1,7X,A3,A2,13X,A10,29X,A10,1X,A2)
 1020 FORMAT(11X,A4,1X,2A9,A7,1X,2A9,A7)
 1030 FORMAT(17X,2A10,3(2X,A5,1X,A6))
 2000 FORMAT(*1  ERROR IN NORMALIZED SPL INPUT.  DATA FOR ACC= *,A3,
     1 * WILL BE DELETED.*)
 3000 FORMAT(*1  THE NORMALIZED REFERENCE FILE CONTAINS DATASETS FOR MOR
     1E THAN *,I2,* DIFFERENT OPERATION POWER CODES FOR AIRCRAFT CODE= *
     2,A3/*   THE MAXIMUM NUMBER PERMITTED BY THE PROGRAM ARRAY DIMENSIO
     3NS IS *,I2/*   NO DATA WILL BE PROCESSED FOR THIS AIRCRAFT.*)
 3100 FORMAT(*1  NO NORMALIZED DATASETS WERE FOUND FOR AIRCRAFT CODE= *,
     1A3)
 3200 FORMAT(*1  NO DATA FOR AFTERBURNER, WET OR WITH JETS (IFC>0) FOUND
     1 IN THE NORMALIZED REFERENCE FILE.*/ *   ALL COMPUTATIONS FOR ACC
     2= *,A3,* WILL BE DELETED FROM THIS JOB.*)
      END
```

```
      FUNCTION ICV(R)
C*********************************************************************
C*********************************************************************
C
C  DECK 6   FUNCTION 'ICV'
C  THIS FUNCTION IS CALLED FROM NUMEROUS ROUTINES THROUGHOUT THE
C  PROGRAM.  FUNCTION 'ICV' CONVERTS VARIABLE 'R' TO AN INTEGER.
C  'R' IS ROUNDED UP IF THE FRACTIONAL PART IS 0.5 OR GREATER.
C
C*********************************************************************
C*********************************************************************
      ICV=R
      DD=R-FLOAT(ICV)
      IF (ABS(DD) .GE. 0.499999) ICV=ICV+ISIGN(1,ICV)
      RETURN
      END
```

```
      SUBROUTINE CDIST(IRD,D1,II)
C*****************************************************************
C*****************************************************************
C
C  DECK 7   CDIST---COMPUTE SINGLE EVENT NOISE DATA FOR 22 DISTANCES
C  THIS SUBROUTINE IS CALLED FROM THE 'OMEGA11' ROUTINE TO COMPUTE THE
C  PNL, PNLT, AL AND ALT PROFILE DATASETS.
C       THE 'PNL' PROFILE DATASET, FOR EXAMPLE, CONTAINS 'PNL' DATA FOR
C  ANGLES 0 TO 180 DEGREES FOR 22 DISTANCES FROM 200 TO 25000 FEET.
C
C-----------------------------------------------------------------
C
C  NOTE: EA(13,13) IS DEFINED ONLY FOR FREQUENCIES 50 (B=17) TO 800 HZ
C       (B=29) AND DISTANCES 400 FEET TO 6300 FEET.
C       EA=0 FOR SX(I)<400 FEET
C       EA=EA(13,J) FOR SX(I)> 6300 FEET.
C
C*****************************************************************
C*****************************************************************
      DIMENSION  EA(13,13),SENX(19,22,12)
      COMMON M,MM,IBNL,IBNH,NC, L,N,K,DIST,MEAS(7),FSPL(19,24,6),SPLX(19
     1,24),PNLX(19,22,2),PNLTX(19,22,2),ALX(19,22,2),ALTX(19,22,2),
     2SENXD(19,22,4),CXD(19)
      COMMON /ATTNC/ ATNC(24),ATNO(24),SX(22)
      EQUIVALENCE  (PNLX(1,1,1),SENX(1,1,1))
C  ARRAY 'EA' CONTAINS THE EXCESS ATTENUATION DATA; SEE NOTE ABOVE.
      DATA EA/    0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 1.09, 2.61,
     1 4.53, 6.94,10.04,13.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 1.18,
     2 2.68, 4.57, 6.94, 9.93,12.53,15.00, 0.00, 0.00, 0.00, 0.00,  .00,
     3 1.04, 2.34, 3.98, 6.05, 8.55,11.92,14.53,17.00, 0.00, 0.00, 0.00,
     4  .38, 1.25, 2.35, 3.74, 5.48, 7.68,10.44,13.92,16.53,19.00, 0.00,
     5  .13,  .68, 1.38, 2.25, 3.35, 4.74, 6.48, 8.68,11.44,14.92,17.53,
     620.00,  .19,  .63, 1.18, 1.88, 2.75, 3.85, 5.24, 6.98, 9.18,11.94,
     715.42,18.03,20.50,  .19,  .63, 1.18, 1.88, 2.75, 3.85, 5.24, 6.98,
     8 9.18,11.94,15.42,18.03,20.50, 0.00,  .13,  .68, 1.38, 2.25, 3.35,
     9 4.74, 6.48, 8.68,11.44,14.92,17.53,20.00, 0.00, 0.00, 0.00, 0.00,
     A  .15, 1.02, 2.11, 3.48, 5.21, 7.39,10.14,13.64,17.00, 0.00, 0.00,
     B 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 1.41, 3.20, 5.45, 8.28,11.00,
     C 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00,  .12, 1.03, 2.17,
     D 3.62, 5.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00,
     E 0.00,  .68, 1.86, 3.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00,
     F 0.00, 0.00, 0.00, 0.00,  .39, 1.00/
      FJ=0.15
      C1=DIST*0.001
C  ARRAY 'SX(22)' CONTAINS EXACT DISTANCE VALUES IN FEET (SEE 'OMEGA11'
C  ROUTINE).
C  LABEL 260 LOOP --- COMPUTE PROFILE DATA FOR EACH PROFILE DISTANCE
C                  (K) FOR THE L-TH REFERENCE POWER CONDITION:
      DO 260 K=1,22
C  'IRD' IS THE STANDARD DISTANCE INDEX CORRESPONDING TO THE REFERENCE
C  DISTANCE (PRESENTLY 250 FEET); REFERENCE DISTANCE MUST BE WITHIN 1 %
C  OF A STANDARD DISTANCE---SEE SX(22). IRD=2 WHEN DIST=250 FEET.
      SXK=SX(K)*0.001
      D2=D1-20.0*ALOG10(SX(K))
C  DO LOOP 135 ---> COMPUTE 'SPL' SPECTRUM FOR K-TH STANDARD DISTANCE
```

```
C  AND STORE IN 'SPLX(I,J)'.
      DO 135 J=IBNL,IBNH,KM
      IF (J-13) 60,60,100
   60 IF (K-3) 100,100,70
   70 IF (K-16) 80,80,90
   80 EAD=EA(K-3,J)
      GO TO 110
   90 EAD=EA( 13,J)
      GO TO 110
  100 EAD=0.0
C  ARRAYS 'ATNB(24)' AND 'ATNC(24)' CONTAIN THE ATMOSPHERIC ABSORPTION
C  DATA FOR THE PROFILE AND REFERENCE WEATHER CONDITIONS RESPECTIVELY.
  110 D3=EAD+SXK*ATNB(J)
      D3=D2-D3+C1*ATNC(J)
C  NO EA NEEDED FOR DISTANCE D(2) IF = 250 FEET.
      DO 130 I=1,19
      SPLX(I,J)=FSPL(I,J,L)+D3
  130 CONTINUE
  135 CONTINUE
C  DO LOOP 250 ---> COMPUTE THE PROFILE DATA FOR THE K-TH DISTANCE AND
C                   I-TH ANGLE:
      DO 250 I=1,19
      IF (K .EQ. IRD) GO TO 140
      IF (MEAS(1)) 160,160,140
C  CALL SUBROUTINE 'CPNL' TO COMPUTE PNLX(I,K,II).
  140 CALL CPNL(FJ,I,II)
      IF (PNLX(I,K,II)-9990.0) 160,150,150
C  IF PNLX(I,K,II) IS MISSING, EXTRAPOLATE MISSING DATA POINTS BY USING
C  THE SLOPE OF THE PREVIOUS TWO POINTS.
C  'PNLX(I,K,II)' ARE EXTRAPOLATED TO MAKE THE PROFILE DATASET COMPLETE.
C  IT WILL NORMALLY BE MISSING ONLY WHERE THE 'SPL' DATA ARE VERY SMALL
C  FOR LARGE DISTANCES.
  150 IF (K .LE. 2) GO TO 160
      PNLX(I,K,II)=2.0*PNLX(I,K-1,II)-PNLX(I,K-2,II)
  160 IF (K .EQ. IRD) GO TO 170
      IF (MEAS(2)+MEAS(3)) 250,250,180
C  CALL SUBROUTINE 'CPTC' TO COMPUTE TONE CORRECTION (PTC) FOR THE I-TH
C  SPECTRA AND FOR THE 'IRD' (REFERENCE) DISTANCE ONLY.
  170 CALL CPTC(PTC,I)
C  STORE COMPUTED TONE CORRECTION FOR REFERENCE DISTANCE (IRD) IN
C  'CXD(I)'.
      CXD(I)=PTC
C  CALL SUBROUTINE 'CAL'  TO COMPUTE ALX(I,K,II).
  180 CALL CAL(I,II)
  250 CONTINUE
  260 CONTINUE
C  DO LOOP 400 ---> COMPUTE SMOOTHED TONE CORRECTION AND ALSO
C  COMPUTE 'PNLTX(I,K,II)' AND 'ALTX(I,K,II)' USING SMOOTHED TONE
C  CORRECTION.
      IF (MEAS(1)+MEAS(3)) 270,270,275
  270 K1=IRD
      K2=IRD
      GO TO 280
  275 K1=1
      K2=22
```

```
280 DO 400 K=K1,K2
    IF (K-14) 285,290,290
285 C1=1.0
    GO TO 310
290 IF (K-18) 295,300,300
295 C1=0.2*FLOAT(18-K)
    GO TO 310
300 C1=0.0
310 IF (K .EQ. IRO) GO TO 320
    IF (MEAS(3)) 335,335,320
C  COMPUTE TONE-CORRECTED A-WEIGHTED OVERALL SOUND LEVEL FOR EACH ANGLE:
320 DO 325 I=1,19
325 ALTX(I,K,II)=ALX(I,K,II)+C1*CXD(I)
    IF (K .EQ. IRO) GO TO 340
335 IF (MEAS(1)) 400,400,340
C  COMPUTE TONE-CORRECTED PERCEIVED NOISE LEVEL FOR EACH ANGLE:
340 DO 360 I=1,19
    IF (PNLX(I,K,II)-9999.0) 345,350,350
345 PNLTX(I,K,II)=PNLX(I,K,II)+C1*CXD(I)
    GO TO 360
350 PNLTX(I,K,II)=9999.0
360 CONTINUE
400 CONTINUE
    RETURN
    END
```

```
      SUBROUTINE CPNL(FJ,I,II)
C************************************************************************
C************************************************************************
C
C   DECK 6   CPNL--- COMPUTE PNL DATA FOR I-TH ANGLE
C   CALLED FROM SUBROUTINE 'CDIST'.
C   SUBROUTINE CPNL(I) COMPUTES PERCEIVED NOISE LEVEL (PNL) USING THE
C   METHOD DESCRIBED IN FAR PART 36 SECTION B36.2.  FUNCTION FNOY
C   (SEE DECK 09) IS USED TO COMPUTE THE NOY VALUES.
C
C   PERTINENT VARIABLES USED BY CPNL ARE:
C      SPLX        - ARRAY CONTAINING SOUND PRESSURE LEVEL DATA IN DB
C                    FOR K-TH DISTANCE
C      PNL         - PERCEIVED NOISE LEVEL IN PNDB
C      I           - INDEX OF SPL SPECTRUM FOR WHICH PNL IS BEING COMPUTED
C      K           - INDEX OF DISTANCE  FOR WHICH PNL IS BEING COMPUTED
C      II          - INDEX OF ARRAY 'PNL' IN WHICH PNL DATA ARE STORED
C                    (II=1 OR 2).
C
C************************************************************************
C************************************************************************
C**                                                                   **
C**       IN THIS SUBROUTINE IBNL=1 CORRESPONDS TO BAND 17 AND IBNH=24 **
C**       CORRESPONDS TO BAND 40.  IF THIS IS CHANGED IN THE PROGRAM,  **
C**       THIS SUBROUTINE MUST BE CHANGED ACCORDINGLY.                 **
C**       PNL(I) IS ONLY COMPUTED FOR BANDS 17 TO 40.                  **
C**       IF IBNL AND IBNH ARE OUTSIDE THIS RANGE, CHANGES MUST BE     **
C**       MADE IN THIS SUBROUTINE TO LIMIT COMPUTATIONS TO THIS RANGE. **
C**                                                                   **
C************************************************************************
      COMMON M,MM,IBNL,IBNH,NC, L,N,K,DIST,MEAS(3),FSPL(19,24,6),SPLX(19
     1,24),PNL(19,22,2)
      SUM=0
      AMX=-10.0
      DO 60 J=IBNL,IBNH,MM
      JJ=J
      IF (SPLX(I,J) .GT. 9990.0) GO TO 60
      SPLL=SPLX(I,J)
C   MAXIMUM SPL IN NOY ALGORITHM IS 150.0
      IF (SPLL.GT. 150.00001) GO TO 70
C
C   USE FUNCTION FNOY TO COMPUTE NOY VALUE (FN) FOR SOUND PRESSURE LEVEL
C   SPLL AND ADJUSTED BAND NUMBER JJ.
C
      FN=FNOY(SPLL,JJ)
C   MAXIMUM PERMITTED NOY VALUE IS 2048.0
      IF (FN .GT. 2048.0001) GO TO 70
      AMX=AMAX1(AMX,FN)
      SUM=SUM+FN
   60 CONTINUE
      IF (SUM .LE. 0.0001) GO TO 70
      SUM=(SUM-AMX)*FJ+AMX
C   COMPUTE PERCEIVED NOISE LEVEL (PNL) FOR THE I-TH SPECTRUM.
      PNL(I,K,II)=40.0+33.3*ALOG10(SUM)
      GO TO 100
```

```
C   'PNL' =9999.0 FOR MISSING DATA:
   70 PNL(I,K,II)=9999.0
  100 CONTINUE
      RETURN
      END
```

```
      FUNCTION FNOY(SPL,JJ)
C***********************************************************************
C***********************************************************************
C
C  DECK 9   FUNCTION 'FNOY'
C  CALLED FROM SUBROUTINE 'CPNL'.
C  FUNCTION FNOY(SPL,JJ) COMPUTES THE NOY VALUE FOR A GIVEN SOUND
C  PRESSURE LEVEL (SPL) AND 1/3 OCTAVE BAND CENTER FREQUENCY (JJ) USING
C  THE METHOD DESCRIBED IN ARP 865A.  (THIS DIFFERS FROM THE METHOD
C  DESCRIBED IN FAR PART 36 SECTION B36.7 IN THAT IT COMPUTES THE NOY
C  VALUE DOWN TO 0.1 INSTEAD OF STOPPING AT 1.0)
C
C  VARIABLES REQUIRED BY FUNCTION FNOY ARE:
C     SPL  - SOUND PRESSURE LEVEL IN DB
C     JJ   - ARRAY INDEX CORRESPONDING TO A BAND NUMBER
C     FL   - ARRAY CONTAINING THE BAND SOUND PRESSURE LEVELS FROM TABLE
C            II OF ARP 865A.
C     FM   - ARRAY CONTAINING THE RECIPROCALS OF THE SLOPES GIVEN IN
C            TABLE II OF ARP 865A.
C
C***********************************************************************
C***********************************************************************
      DIMENSION FL(24,5),FM(24,4)
      DATA FL/49.,44.,39.,34.,30.,27.,24.,21.,18.,5*16.,15.,12.,9.,5.,
     A4.,5.,6.,10.,17.,21.,55.,51.,46.,42.,39.,36.,33.,30.,27.,5*25.,
     B23.,21.,18.,15.,2*14.,15.,17.,23.,29.,64.,60.,56.,53.,51.,48.,46.,
     C44.,42.,5*40.,38.,34.,32.,30.,2*29.,30.,31.,37.,41.,91.01,85.88,
     D67.32,79.85,79.76,75.96,73.96,74.91,94.63,13*100.0,44.29,50.72,
     E52.,51.,49.,47.,46.,45.,43.,42.,41.,5*40.,38.,34.,32.,30.,2*29.,
     F30.,31.,34.,37./
      DATA FM/0.079520,2*0.06816,0.05964,10*0.053013,0.059640,2*0.053013
     G,2*0.047712,2*0.053013,0.068160,0.079520,0.059640,2*0.058098,
     H0.052286,0.047534,2*0.043573,0.040221,0.037349,7*0.034859,0.040221
     I,0.037349,4*0.034859,2*0.037349,0.043573,0.043478,0.040570,
     J2*0.036631,0.035336,2*0.033333,0.032051,0.030675,6*0.030103,
     K7*0.029960,2*0.042285,15*0.030103,9*0.029960/
      IF (SPL .LT. FL(JJ,1)) GO TO 20
      IF (SPL .GT. 150.0) GO TO 30
      IF (SPL .GE. FL(JJ,1) .AND. SPL .LT. FL(JJ,2)) GO TO 40
      IF (SPL .GE. FL(JJ,2) .AND. SPL .LT. FL(JJ,3)) GO TO 50
      IF (SPL .GE. FL(JJ,3) .AND. SPL .LT. FL(JJ,4)) GO TO 60
      IF (SPL .GE. FL(JJ,4) .AND. SPL .LE. 150.00001) GO TO 70
   20 FNOY=0.0
      RETURN
   30 FNOY=5001.0
      RETURN
   40 FNOY=0.1*10.0**(FM(JJ,1)*(SPL-FL(JJ,1)))
      RETURN
   50 FNOY=10.0**(FM(JJ,2)*(SPL-FL(JJ,3)))
      RETURN
   60 FNOY=10.0**(FM(JJ,3)*(SPL-FL(JJ,3)))
      RETURN
   70 FNOY=10.0**(FM(JJ,4)*(SPL-FL(JJ,5)))
      RETURN
      END
```

```
      SUBROUTINE CPTC(PTC,I)
C*****************************************************************
C*****************************************************************
C
C  DECK 10  CPTC---CALLED FROM SUBROUTINE 'CDIST'.
C
C  SUBROUTINE CPTC(PTC,I)        COMPUTES THE TONE CORRECTION FOR THE
C  I-TH SPECTRUM AS DESCRIBED IN FAR PART 36 SECTION B36.3.
C
C  WHERE.....
C     PTC        - TONE CORRECTION FOR THE I-TH SPECTRUM IN DB
C     I          - INDEX OF ARRAY SPLX--SPECIFIES SPECTRUM USED TO
C                  COMPUTE PTC.
C     SPLX       - ARRAY CONTAINING SOUND PRESSURE LEVEL DATA IN DB
C                  FOR K-TH DISTANCE
C
C     K          - INDEX OF DISTANCE  FOR WHICH PTC IS BEING COMPUTED
C*****************************************************************
C*****************************************************************
C**                                                              **
C**       IN THIS SUBROUTINE IBNL=1 CORRESPONDS TO BAND 17 AND IBNH=24 **
C**       CORRESPONDS TO BAND 40.  IF THIS IS CHANGED IN THE PROGRAM,  **
C**       THIS SUBROUTINE MUST BE CHANGED ACCORDINGLY.                 **
C**       PTC IS ONLY COMPUTED FOR BANDS 19 TO 40.                     **
C**       IF IBNL AND IBNH ARE OUTSIDE THIS RANGE, CHANGES MUST BE     **
C**       MADE IN THIS SUBROUTINE TO LIMIT COMPUTATIONS TO THIS RANGE. **
C**                                                              **
C*****************************************************************
C*****************************************************************
      DIMENSION SPLPP(24),ICT(24)
      COMMON   DMY( 2),IBNL,IBNH,DM(8),FSPL(19,24,6),SPLX(19,24)
     1,SENXD(19,22,12),CXD(19),SP(25),S(24),SPL(24),F(24),SPLP(24)
      EQUIVALENCE (F(1),ICT(1)),(SPLP(1),SPLPP(1))
      C=0.0
      PTC=0.0
      ILL=3
      IF (IBNL .GT. 3) ILL=IBNL
      AMX=-1000.0
C  DO LOOP 420 --- DETERMINE MAXIMUM SPL VALUE AND ARRAY INDEX OF THIS
C  MAXIMUM VALUE.
      DO 420 J=ILL,IBNH
      SPL(J)=SPLX(I,J)
      IF (SPL(J) .GT. 9990.0) GO TO 420
      IF (SPL(J)-AMX) 420,400,400
  400 IL1=J
      AMX=SPL(J)
  420 CONTINUE
C  IF 'AMX' < -900.0 --- ALL SPL DATA ARE MISSING FOR THIS SPECTRUM;
C  THE FOLLOWING STATEMENT REALLY DOESN'T APPLY TO OMEGA 11 DATA;
      IF (AMX .LT. -900.0) GO TO 220
C  DO LOOP 440 --- DETERMINE FIRST SPL VALUE < 20 DB FROM PEAK TO THE
C  END OF THE SPECTRUM;
      DO 440 J=IL1,IBNH
      IH1=J
      IF (SPL(J) .LT. 20.0) GO TO 450
```

```
440 CONTINUE
    GO TO 460
450 IH1=IH1-1
C  DO LOOP 470 --- DETERMINE FIRST SPL VALUE < 20 DB FROM THE PEAK TO
C  THE BEGINNING OF THE SPECTRUM:
460 DO 470 J=ILL,IL1
    IL2=IL1-J+ILL
    IF (SPL(IL2) .LT. 20.0) GO TO 480
470 CONTINUE
    GO TO 490
480 IL2=IL2+1
C
C  IL2 ---> IH1 IS THE FREQUENCY INDEX OVER WHICH TONE CORRECTION IS
C  COMPUTED.  ALL SPL(J)>20.0 DB OVER THIS RANGE.
C  IF (IH1-IL2-8) < 1, THERE ARE AT MOST NINE GOOD FSPL VALUES IN THE
C  SPECTRUM; THUS PTC=0. IN THIS PROGRAM 10 GOOD BANDS ARE REQUIRED.
C
490 IF (IH1-IL2-8) 220,220,5
  5 IF (IL2 .LT.  3) IL2=3
C  IL2 AND IH1 ARE THE INDICES OF THE FIRST AND LAST GOOD FSPL VALUE IN
C  THE SPECTRUM.
    S(IL2)=0
    ICT(IL2)=0
C  FROM HERE TO LABEL 40 CORRESPONDS TO STEPS 1, 2 AND 3 IN SECTION
C  B36.3.
    IL3=IL2+1
    IL1= IL3 + 1
    ICT(IL3)=0
    S(IL3)=SPL(IL3)-SPL(IL2)
C  COMPUTE SPL CHANGES (SLOPES) AND SET ICT(J) FLAG; ICT(J)=1
C  CORRESPONDS TO ENCIRCLED SPL IN 'FAR PART 36'.
    DO 40 J=IL1,IH1
    ICT(J)=0
    S(J)=SPL(J)-SPL(J-1)
    IF (ABS(S(J)-S(J-1))-5.0) 40,40,20
 20 IF (S(J) .GT. 0.0 .AND. S(J) .GT. S(J-1)) GO TO 30
    IF (S(J) .LE. 0.0 .AND. S(J-1) .GT. 0.0) ICT(J-1)=1
    GO TO 40
 30 ICT(J)=1
 40 CONTINUE
C  FROM HERE TO 2 LINES AFTER LABEL 80 CORRESPONDS TO STEPS 4 AND 5
C  IN SECTION B36.3.
    SPLP(IL2)=SPL(IL2)
    DO 80 J=IL3,IH1
    IF (ICT(J)) 50,50,60
 50 SPLP(J)=SPL(J)
    GO TO 80
 60 IF (J .EQ. IH1) GO TO 70
C  FOR FLAGGED SPL, COMPUTE AVERAGE OF SPL BEFORE AND AFTER:
    SPLP(J)=0.5*(SPL(J-1)+SPL(J+1))
    GO TO 80
 70 SPLP(J)=SPL(J-1)+S(J-1)
C  COMPUTE NEW SLOPE (S') -- STEP 5:
 80 SP(J)=SPLP(J)-SPLP(J-1)
    SP(IL2)=SP(IL3)
```

```
      SP(IM1+1)=SP(IM1)
C  FROM HERE TO LABEL 210 CORRESPONDS TO STEPS 6 TO 10 IN SECTION B36.3.
C  FIRST SPL''=INITIAL SPL:
      SPLPP(IL2)=SPL(IL2)
      DO 210 J=IL2,IM1
      IF (J-IM1) 90,100,100
C   COMPUTE THE AVERAGE SLOPE -- STEP 6:
   90 SA=    (SP(J)+SP(J+1)+SP(J+2))/3.0
C   ADD THE AVERAGE SLOPE TO THE PREVIOUS SPL'' --- STEP 7:
      SPLPP(J+1)=SPLPP(J)+SA
C  F(J) IS THE SOUND PRESSURE LEVEL DIFFERENCE (STEP 8); IF F(J) < 3,
C   TONE CORRECTION IS ZERO.
  100 F(J)=SPL(J)-SPLPP(J)
      IF (F(J)-3.0) 210,110,110
  110 IF (J .GE. 11 .AND. J .LE. 21) GO TO 140
C   DETERMINE 'C' FOR FREQUENCIES 50 TO 400 HZ AND 6300 TO 10000 HZ:
      IF (F(J)-20.0) 120,130,130
  120 C=F(J)/6.0
      GO TO 160
  130 C=3.3333333
      GO TO 160
C   DETERMINE 'C' FOR FREQUENCIES 500 TO 5000 HZ:
  140 IF (F(J)-20.0) 145,150,150
  145 C=F(J)/3.0
      GO TO 160
C   MAXIMUM TONE CORRECTION IS 6.6666667 DB.
  150 C=6.6666667
  160 IF (C-PTC) 210,210,170
  170 PTC=C
C     IPTC(I)=J
  210 CONTINUE
      RETURN
  220 CONTINUE
      RETURN
      END
```

```
      SUBROUTINE CAL(I,II)
C*********************************************************************
C*********************************************************************
C
C  DECK 11  CAL---CALLED FROM SUBROUTINE 'CDIST'.
C  THIS SUBROUTINE COMPUTES THE A-WEIGHTING OVERALL SOUND LEVEL.
C
C  WHERE.....
C     K      - INDEX OF DISTANCE  FOR WHICH AL  IS BEING COMPUTED
C     I      - INDEX OF ARRAY SPLX--SPECIFIES SPECTRUM USED TO COMPUTE AL.
C     AL     - ARRAY CONTAINING THE A-WEIGHTING OVERALL SOUND LEVEL IN DBA
C     AW     - ARRAY CONTAINING THE A-WEIGHTING COEFFICIENTS DEFINED
C              ONLY FOR BANDS IBL=17 TO IBH=40
C     SPLX - ARRAY CONTAINING SOUND PRESSURE LEVEL DATA IN DB
C              FOR K-TH DISTANCE
C     II     - INDEX OF ARRAY AL IN WHICH A-WEIGHTING DATA ARE STORED
C              (II=1 OR 2).
C
C*********************************************************************
C*********************************************************************
C**                                                                 **
C**      IN THIS SUBROUTINE IBNL=1 CORRESPONDS TO BAND 17 AND IBNH=24 **
C**      CORRESPONDS TO BAND 40.  IF THIS IS CHANGED IN THE PROGRAM,  **
C**      THIS SUBROUTINE MUST BE CHANGED ACCORDINGLY.                 **
C**                                                                 **
C*********************************************************************
      DIMENSION AW(24)
      COMMON M,MM,IBNL,IBNH,NC, L,N,K,DIST,MEAS(3),FSPL(19,24,6),SPLX(19
     1,24),PNLX(19,22,2),PNLTX(19,22,2),AL(19,22,2)
      DATA AW/-30.2,-26.2,-22.5,-19.1,-16.1,-13.4,-10.9,-8.6,-6.6,-4.8,
     A-3.2,-1.9,-0.8,0.0,0.6,1.0,1.2,1.3,1.2,1.0,0.5,-0.1,-1.1,-2.5/
      ALD=0.0
      DO 10 J=IBNL,IBNH,MM
      IF (SPLX(I,J) .GT. 9950.0) GO TO 10
      ALD=ALD+ 10.0**((SPLX(I,J)+AW(J))/10.0)
   10 CONTINUE
      IF (ALD .LT. 0.000001) GO TO 20
      AL(I,K,II)= 10.0*ALOG10(ALD)
      GO TO 50
C  AL=9999.0 FOR MISSING DATA.
   20 AL(I,K,II)=9999.0
   50 RETURN
      END
```

```
      SUBROUTINE PPFDAT(J1,J2,JI,L1,L2,IPR,IEDIT)
C*********************************************************************
C*********************************************************************
C
C  DECK 12  SUBROUTINE 'PPFDAT'
C  THIS SUBROUTINE IS CALLED FROM THE 'OMEGA11' ROUTINE TO WRITE THE
C  PROFILE DATASETS FOR 'PNLTX', 'ALT', AND 'ALTX' ON FILE 'TAPE2' WHEN
C  IEDIT>-1.  THESE DATA ARE STORED IN ARRAY 'SENX(19,22,12)'.
C
C  EACH PROFILE DATASET CONSISTS OF THE FOLLOWING:
C     1) ONE 'COMDECK' CARD;
C     2) THREE 'COMMENT' CARDS;
C     3) THREE DATA CARDS FOR EACH OF THE 19 ANGLES CONTAINING NOISE
C        LEVEL DATA FOR THE 22 STANDARD DISTANCES.
C
C  FOR MORE DETAILS SEE THE WRITE-UP ENTITLED: 'CARD FORMAT FOR GROUND
C  RUNUP NOISE PROFILE DATASETS'.
C
C  THIS SUBROUTINE ALSO WRITES THE 'PNLX', 'PNLTX', 'ALX', AND 'ALTX'
C  PROFILE DATA (AS REQUESTED) ON OUTPUT PAGES D, E, F, AND G
C  WHEN IPR>0.
C
C  THE SUBROUTINE ARGUMENTS ARE:
C     J1     -- INDEX OF 'PNLTX' DATA IN ARRAY 'SENX'.
C     J2     -- INDEX OF 'ALTX'  DATA IN ARRAY 'SENX'.
C     JI     -- INCREMENT OF THE INDEX OF THE PROFILE DATA IN ARRAY SENX
C               (JI=1 OR 2).
C     L1,L2 -- INDICIES OF NORMALIZED DATA USED TO INTERPOLATE PROFILE
C               DATA.
C     IPR    -- PROGRAM PRINT FLAG.
C     IEDIT -- PROGRAM ANGLE SELECTION FLAG.
C
C*********************************************************************
C*********************************************************************
      DIMENSION OKEY(3),CKEY(3),NR(17,3),        T12(2),IDIST(22)
      COMMON M,MM,IBNL,IBNH,NC, L,N,K,DIST,MEAS(3),FSPL(19,24,6),
     1  SPLX(19,24),SENX(19,22,12),R(19),FMT(22)
      COMMON /HEADC/ TEST(6),TT(6,6),DATE,RUN(6),IPAGE,IVER,ACC,OPC(6),
     1 IT,P1,IHH,IT8,P6,IH8,FIMPR3,PV,CRI,PS(6,6),OPD(2,6),OPCC(6),DELN
     2, PSC(6),PSU,NP,PSIF(6),PSCF(6),NRC(6),ICC,OPCDM,OPD1,OPD2
     3,  COMD(6),RUNC(6),IC,DATN(5),IFC(6),IFCC,IFI(6),IFII
      EQUIVALENCE (SPLX(1,1),NR(1,1))
      DATA T12/10H(5X,1H(,I7,3H,2X/,RP/6H,2H ))/,A6/3H,A6/,T6/5H,F6.1/
C  ARRAY 'IDIST' CONTAINS THE STANDARD DISTANCES USED FOR PRINTING ONLY.
      DATA IDIST/          200,250,315,400,500,630,800,1000,1250,1500,
     12000,2500,3150,4000,5000,6300,8000,10000,12500,16000,20000,25000/
      DATA OKEY/4HPNLT,4HAL  ,4HALT /,BLK/1H /, CKEY/1HP,1HA,1HT/
      J=0
      OPCDM=OPCC(ICC)
      IF (L) 5,5,10
    5 OPD1=BLK
      OPD2=BLK
      GO TO 15
   10 OPD1=OPD(1,L)
      OPD2=OPD(2,L)
```

```
   15 IF (IEDIT) 110,20,20
C  DO LOOP 100---WRITE PROFILE DATA ON FILE 'TAPE2' (FOR IEDIT>-1):
   20 DO 100 JJ=J1,J2,JI
      J=J+1
      IF (MEAS(J)) 100,100,30
C  WRITE 'COMDECK' CARD:
   30 WRITE(2,2100) CKEY(J),ACC,OPCOM, PV,CRI
      IA=0
      ICD=1
C  WRITE FIRST DATA CARD FOR ANGLE 0 DEGREES:
      WRITE(2,2000) DKEY(J),ACC,OPCOM, IA,(SENX(1,K,JJ),K=1,6),ICD
C  WRITE FIRST 'COMMENT' CARD:
      WRITE(2,2110) ACC,OPCOM, PV,CRI,IVER,DATE,IT8,IH6,P8,TEST(1),
     1  RUNC(IC)
C  TT(6,1) CONTAINS 'NOISE SOURCE/SUBJECT' DATA FOR THE FIRST REFERENCE
C  FILE OPERATION POWER CODE --- 2 LINES OF 25 CHARACTERS. THESE 2 LINES
C  ARE WRITTEN ON THE SECOND COMMENT CARD FOR EACH PROFILE DATASET.
C  WRITE SECOND AND THIRD 'COMMENT' CARDS:
      IF (L) 35,35,40
   35 WRITE(2,2120) ACC,OPCOM, PV,CRI,(TT(I,1),I=1,6),ACC,COMD(L1),
     1 COMD(L2),     ACC,OPCOM, PV,CRI,OPD1,OPD2,PSC(ICC),PSU
      GO TO 45
   40 WRITE(2,2125) ACC,OPCOM, PV,CRI,(TT(I,1),I=1,6),ACC,COMD(L),
     1          ACC,OPCOM, PV,CRI,OPD1,OPD2,PSC(ICC),PSU,(PS(I,L),I=3,6)
   45 ICD=2
C  WRITE SECOND AND THIRD 'DATA' CARDS FOR ANGLE 0 DEGREES:
      WRITE(2,2010) (SENX(1,K,JJ),K= 7,14),ICD
      ICD=3
      WRITE(2,2010) (SENX(1,K,JJ),K=15,22),ICD
      IAC=0
C  DO LOOP 80 --- WRITE 3 DATA CARDS FOR ANGLES 10 TO 170 DEGREES:
      DO 80 I=2,18
      IF (IEDIT) 50,50,60
   50 II=I-1
      IF (NR(II,J) .LE. 9) GO TO 80
C  'IA' IS ANGLE IN DEGREES:
   60 IA=(I-1)*10
C  STORE ANGLES WRITTEN ON FILE 'TAPE2' IN NR(IAC,J) FOR J-TH MEASURE.
      IAC=IAC+1
      NR(IAC,J)=IA
      ICD=ICD+1
      WRITE(2,2000) BLK,   ACC,OPCOM, IA,(SENX(I,K,JJ),K=1,6),ICD
      ICD=ICD+1
      WRITE(2,2010) (SENX(I,K,JJ),K= 7,14),ICD
      ICD=ICD+1
      WRITE(2,2010) (SENX(I,K,JJ),K=15,22),ICD
   80 CONTINUE
      I=19
      IA=180
      ICD=ICD+1
C  WRITE 3 DATA CARDS FOR THE 180 DEGREE ANGLE:
      WRITE(2,2000) BLK,   ACC,OPCOM, IA,(SENX(I,K,JJ),K=1,6),ICD
      ICD=ICD+1
      WRITE(2,2010) (SENX(I,K,JJ),K= 7,14),ICD
      WRITE(2,2010) (SENX(I,K,JJ),K=15,22)
```

```
  100 CONTINUE
C  SETUP VARIABLE FORMAT ARRAY FOR PRINTING PROFILE DATA.
  110 IF (IPR .LT. 1) RETURN
      FMT(1)=T12(1)
      FMT(2)=T12(2)
      FMT(22)=RP
C  DO LOOP 400 ---> PRINT PROFILE DATASET DATA FOR PNL, PNLT, AL AND
C  ALT.
      JJ=0
C  JJ1 --- INDEX OF 'PNL' DATA WHICH IS NOT WRITTEN ON FILE 'TAPE2':
      JJ1=J1-JI
      DO 400 J=JJ1,J2,JI
      JJ=JJ+1
      IF (JJ .EQ. 1) GO TO 150
      IF (MEAS(JJ-1)) 400,400,160
  150 IF (MEAS(JJ))    400,400,160
  160 JJJ=JJ+1
      CALL HEADS(JJJ)
C  'K' IS DISTANCE INDEX:
      DO 350 K=1,22
C  'I' IS ANGLE INDEX:
      DO 340 I=1,19
      IF (SENX(I,K,J)) 325,330,320
  320 IF (SENX(I,K,J)-9990.0) 330,325,325
C  BLANK OUT MISSING OR NEGATIVE PROFILE DATA FOR PNL TO ALT:
  325 R(I)=BLK
      FMT(I+2)=A6
      GO TO 340
  330 R(I)=SENX(I,K,J)
      FMT(I+2)=T6
  340 CONTINUE
C  SKIP LINE BEFORE 8-TH AND 18-TH DISTANCE:
      IF (K .EQ. 8 .OR. K .EQ. 18) WRITE(6,3005)
  350 WRITE(6,FMT)  IDIST(K),R
      WRITE(6,3005)
      WRITE(6,3015)
  400 CONTINUE
 2000 FORMAT(A6,3X,A3,A2,I8,6F8.1,8X,I2)
 2010 FORMAT(6X,6F8.1,8X,I2)
 2100 FORMAT(6H*COMDECK,1X,A1,A3,A2,2A1)
 2110 FORMAT(8HCOMMENT ,A3,A2,2A1, 9H OMEGA11.,I1,1X,A10,I3,3H F ,I3,
     16H PCT  ,F5.2,7H IN HG ,2X,A10,1X,A2)
 2120 FORMAT(8HCOMMENT ,A3,A2,2A1, 2(1X,2A9,A7 ),*N*,A3,A4,*-*,A4/
     1        8HCOMMENT ,A3,A2,2A1, 2X,2A10, 3(2X,A5,1X,A6))
 2125 FORMAT(8HCOMMENT ,A3,A2,2A1, 2(1X,2A9,A7 ),*N*,A3,A4/
     1        8HCOMMENT ,A3,A2,2A1, 2X,2A10, 3(2X,A5,1X,A6))
 3005 FORMAT( 5X,1H(,124X,1H))
 3015 FORMAT(     5X,1H(,124(1H-),1H))
      RETURN
      END
```

```
      SUBROUTINE TITPG
C***********************************************************************
C***********************************************************************
C
C  DECK 13  TITPG---PRINTS THE TITLE PAGE
C  THIS SUBROUTINE IS CALLED FROM THE MAIN ROUTINE   TO PRINT THE
C  COVER PAGE FOR EACH 'OMEGA 11' TEST (AIRCRAFT).
C
C  VARIABLES REQUIRED BY THIS SUBROUTINE ARE:
C     TT(6,6),TEST(6),ACC,PV,IVER         AND DATE.
C
C***********************************************************************
C***********************************************************************
      DIMENSION T(3)
      COMMON M,MM,IBNL,IBNH,NC, L,N,ID,DIST,MEAS(3)
      COMMON /HEADC/ TEST(6),TT(6,6),DATE,RUN(6),IPAGE,IVER,ACC,OPC(6),
     1 IT,P1,IHH,IT8,P8,IH8,FIMPRS,PV,CRI,PS(6,6),OPD(2,6),OPCC(6),DELN
     2, PSC(6),PSU,NP,PSIF(6),PSCF(6),NRC(6),ICC,OPCDM,OPD1,OPD2
     3,  COMD(6),RUNC(6),IC,DATN(5),IFC(6),IFCC,IFI(6),IFII
      DATA BLK/1H /
C  TT(6,1) CONTAINS 'NOISE SOURCE/SUBJECT' DATA FOR THE FIRST OPERATION
C  POWER CODE--- 2 LINES OF 25 CHARACTERS.  THE FIRST LINE IS PRINTED
C  ON THE COVER PAGE.
      DO 10 I=1,3
   10 T(I)=TT(I,1)
C  PRINT THE TOP BORDER LINE:
      WRITE(6,3000)
      IF (T(3) .EQ. BLK) GO TO 705
C  PRINT THE TOP 'NOISE SOURCE/SUBJECT' BORDER LINES:
      DO 700 I=1,3
  700 WRITE(6,3030) T,T,T,T
      GO TO 715
  705 DO 710 I=1,3
  710 WRITE(6,3032) T,T,T,T
  715 DO 720 I=1,16
  720 WRITE(6,3020)
      WRITE(6,3035)
      WRITE(6,3020)
      IF (T(3) .EQ. BLK) GO TO 730
      WRITE(6,3040) T
      GO TO 735
  730 WRITE(6,3042) T
  735 WRITE(6,3020)
      WRITE(6,3045)
      WRITE(6,3020)
      WRITE(6,3020)
      WRITE(6,3020)
C  PRINT THE TEST 'ID' BLOCK:
      WRITE(6,3050)  TEST(1)
      WRITE(6,3055) ACC
      WRITE(6,3065) PV
      WRITE(6,3060) IVER
C  PRINT THE TABLE OF CONTENTS FOR THE 'OMEGA 11' OUTPUT:
      WRITE(6,3100)
      WRITE(6,3120)
```

```
      WRITE(6,3130)
      IF (MEAS(1) .GT. 0) WRITE(6,3135)
      IF (MEAS(2) .GT. 0) WRITE(6,3140)
      IF (MEAS(3) .GT. 0) WRITE(6,3145)
      WRITE(6,3160)
      DO 760 I=1,4
  760 WRITE(6,3020)
      WRITE(6,3155) DATE
      WRITE(6,3020)
      WRITE(6,3020)
      WRITE(6,3160)
      DO 770 I=1,4
  770 WRITE(6,3020)
      IF (T(3) .EQ. BLK) GO TO 790
C  PRINT THE BOTTOM BORDER LINES:
      DO 780 I=1,3
  780 WRITE(6,3030) T,T,T,T
      GO TO 800
  790 DO 795 I=1,3
  795 WRITE(6,3032) T,T,T,T
  800 WRITE(6,3010)
      RETURN
C
 3000 FORMAT(1H1,33(4HUSAF))
 3010 FORMAT( 1X,33(4HUSAF))
 3020 FORMAT( 1X,4HUSAF,124X,4HUSAF)
 3030 FORMAT( 1X,4HUSAF, 4X, 4(1X,2A9,A7,4X), 4HUSAF)
 3032 FORMAT( 1X,4HUSAF, 4X, 4(4X,2A9,A7,1X), 4HUSAF)
 3035 FORMAT( 1X,4HUSAF,47X,31HNOISE PRODUCED ON THE GROUND BY,46X,
     1 4HUSAF)
 3040 FORMAT( 1X,4HUSAF, 50X, 2A9,A7, 49X, 4HUSAF)
 3042 FORMAT( 1X,4HUSAF, 53X, 2A9,A7, 46X, 4HUSAF)
 3045 FORMAT( 1X,4HUSAF,47X,31HDURING GROUND RUN-UP OPERATIONS,46X,4HUSA
     1F)
 3050 FORMAT( 1X,4HUSAF,52X,4HTEST,7X,A10,           51X,4HUSAF)
 3055 FORMAT( 1X,4HUSAF,52X,14HAIRCRAFT CODE:,4X,A3,51X,4HUSAF)
 3060 FORMAT( 1X,4HUSAF,49X,26HCOMPUTER PROGRAM OMEGA 11.,I1,48X,4HUSAF)
 3065 FORMAT( 1X,4HUSAF,52X,16HPROFILE VERSION:,4X,A1,51X,4HUSAF)
 3100 FORMAT( 1X,4HUSAF, 96X,4HPAGE,24X,4HUSAF)
 3120 FORMAT( 1X,4HUSAF,24X, 53HNORMALIZED DATA AS A FUNCTION OF ANGLE A
     1ND FREQUENCY ,47X, 4HUSAF/  1X,4HUSAF,30X, 32HNORMALIZED SOUND PRE
     2SSURE LEVEL ,  36(1H.), 1HC, 25X,4HUSAF)
 3130 FORMAT( 1X,4HUSAF,24X, 59HNOISE LEVEL AS A FUNCTION OF ANGLE AND D
     1ISTANCE FROM SOURCE,  41X,4HUSAF)
 3135 FORMAT(1X,4HUSAF,30X,
     2  22HPERCEIVED NOISE LEVEL ,  46(1H.),  1HD, 25X,4HUSAF/
     3  1X,4HUSAF, 30X, 38HTONE-CORRECTED, PERCEIVED NOISE LEVEL ,30(1H.
     4), 1HE,  25X,4HUSAF)
 3140 FORMAT(                 1X,4HUSAF,30X,  31HA-WEIGHTED OVERALL SOUND
     1LEVEL ,  37(1H.)  1HF,  25X,4HUSAF)
 3145 FORMAT( 1X,4HUSAF, 30X,
     1  47HTONE-CORRECTED, A-WEIGHTED OVERALL SOUND LEVEL ,21(1H.)  1HG,
     2  25X,4HUSAF)
 3155 FORMAT( 1X,4HUSAF,56X,A10,56X,4HUSAF)
 3160 FORMAT( 1X,4HUSAF,25X,73HA E R O S P A C E   M E D I C A L   R E S
```

```
     1 E A R C H   L A B O R A T O R Y, 26X,4HUSAF/   1X,4HUSAF,25X,
     2 73HW R I G H T - P A T T E R S O N   A I R   F O R C E   B A S E
     3,   O H I O, 26X,4HUSAF)
 3130 FORMAT(1X,4HUSAF,24X,49HNOISE LEVEL AS A FUNCTION OF ANGLE AROUND
     1SOURCE ,25(1H.),1HJ,25X,4HUSAF)
C
      END
```

```
      SUBROUTINE PLT(IRD,JJ1,JJ2,JJI)
C*********************************************************************
C*********************************************************************
C
C     DECK 14  SUBROUTINE 'PLT'---CALLED FROM THE MAIN OMEGA11 ROUTINE.
C
C     THIS SUBROUTINE PRINTS A TAB PLOT OF PNLT, AL AND ALT VERSUS ANGLE
C     FOR THE NORMALIZED REFERENCE DISTANCE;  THE DATA ARE FROM THE PROFILE
C     DATASETS.
C
C     ONLY VARIABLES BROUGHT INTO THIS SUBROUTINE ARE THE FOLLOWING:
C        DIST,SENX(19,22,12),IRD,JJ1,JJ2, AND JJI.
C
C     ARRAY 'SENX(19,22,12)' CONTAINS THE 'PNLT', 'AL' AND 'ALT' PROFILE
C     DATA. THE LOCATION  OF THE DATA IN SENX IS DEFINED BY THE IRD, JJ1,
C     JJ2, AND JJI INDICIES.
C
C     IRD -- INDEX OF THE REFERENCE DISTANCE.
C     JJ1 -- INDEX OF 'PNLT' IN ARRAY SENX.
C     JJ2 -- INDEX OF 'ALT'  IN ARRAY SENX.
C     JJI -- INDEX INCREMENT (JJ1+JJI IS INDEX OF 'AL' DATA).
C
C*********************************************************************
C*********************************************************************
      DIMENSION AID(16),SYM(4)
      COMMON M,MM,IBNL,IBNH,NC,LL,N,K,DIST,MEAS(3),FSPL(19,24,6),
     1        SPLX(19,24), SENX(19,22,12),IX(11),P(105,2),JJ(3),SAV(3)
      DATA AID/1HA,1HN,1HG,1HL,1HE,1H ,1HI,1HN,1H ,1HD,1HE,1HG,1HR,1HE,
     1  1HE,1HS/,  SYM/1HP,1HA,1HT,1HX/,BLK/1H /,DOT/1H./
C     DO LOOP 10, 15 AND 20 --- INITIALIZE TAB PLOT ARRAY, P(105,2), WITH
C     GRID DATA.
      DO 10 I=1,105
   10 P(I,1)=BLK
      DO 15 I=1,103,2
      II=I+1
      P(I,2)=DOT
   15 P(II,2)=BLK
      P(105,2)=DOT
      DO 20 I=3,103,10
   20 P(I,1)=DOT
      IA=6
      K=ICV(DIST)
C     CALL SUBROUTINE 'HEADS' TO PRINT TAB PLOT HEADING BLOCK.
      CALL HEADS(IA)
C     PRINT SYMBOL ID LINE:
      WRITE(6,2000)
      WRITE(6,2010)
      WRITE(6,2110) BLK,(P(J,1),J=1,105)
      AMX=-1000.0
C     DO LOOP 25 --- DETERMINE MAXIMUM 'PNLT' NOISE LEVEL AND THUS THE
C     MAXIMUM REQUIRED NOISE LEVEL SCALE VALUE:
      DO 25 I=1,19
      A1=SENX(I,IRD,JJ1)
      IF (A1 .GT. 9990.0) GO TO 25
      AMX=AMAX1(A1,AMX)
```

```
   25 CONTINUE
C  'MX' IS THE MAXIMUM NOISE LEVEL SCALE VALUE.
      MX=((ICV(AMX)/10)+1)*10
      DO 40 I=1,11
C  SETUP ABSCISSA SCALE VALUE:
   40 IX(I)=MX-110+I*10
      MX=MX+2
      MN=IX(1)-2
      JD=2
C  DO LOOP 200 --- SETUP AND PRINT TAB PLOT FOR EACH OF THE 19 ANGLES:
      DO 200 I=1,19
      IF (I .GE. 6 .AND. I .LE. 13) GO TO 70
      A1=BLK
      A2=BLK
      GO TO 80
C  SETUP ORDINATE ID:
   70 J1=(I-6)*2+1
      A1=AID(J1)
      A2=AID(J1+1)
   80 IA=(I-1)*10
      JD=JD+1
C  'JD' (OR ALSO 'L') CONTROLS  TYPE OF GRID LINE PRINTED;
C     L=1 --- DOT EVERY 10 POINTS.
C     L=2 --- DOT EVERY SECOND PRINT POSITION.
      IF (JD .EQ. 3) GO TO 82
      L=1
      GO TO 85
   82 L=2
      JD=0
C  DO LOOP 120 --- SETUP 'PNLT', 'AL' AND 'ALT' DATA POINTS IN PLOT
C  ARRAY.
   85 J3=0
      DO 120 J=JJ1,JJ2,JJI
      J3=J3+1
C  CONVERT NOISE LEVEL TO ARRAY POSITION --- 'J1'.
      J1=ICV(SENX(I,IRD,J))-MN+1
      IF (J1 .LT. 1 .OR. J1 .GT. 105) GO TO 100
      IF (P(J1,L) .EQ. BLK .OR. P(J1,L) .EQ. DOT) GO TO 90
C  SYM(4) IS SYMBOL 'X' FOR COINCIDENT POINTS.
      P(J1,L)=SYM(4)
      GO TO 100
   90 SAV(J3)=P(J1,L)
      P(J1,L)=SYM(J3)
      GO TO 110
  100 J1=0
  110 JJ(J3)=J1
  120 CONTINUE
C  PRINT TAB PLOT LINE FOR ANGLE 'IA'.
      WRITE(6,2100) A1,    IA,(P(J,L),J=1,105)
C  DO LOOP 160 --- REINITIALIZE PLOT ARRAY DELETING PLOTTED DATA POINTS.
      DO 160 J=1,3
      IF (JJ(J)) 160,150,150
  150 J1=JJ(J)
      P(J1,L)=SAV(J)
  160 CONTINUE
```

```
C   PRINT TAB GRID LINES BETWEEN EACH ANGLE:
      WRITE(6,2110) A2,(P(J,1),J=1,105)
  200 CONTINUE
      WRITE(6,2010)
      WRITE(6,2030)   IX
 2000 FORMAT(41X,6HP=PNLT,23X,4HA=AL,23X,5HT=ALT)
 2010 FORMAT(18X,1H(,105(1H-),1H))
 2030 FORMAT( 13X,11(6X,I4)/ 58X,26HNOISE LEVEL IN PNDB OR DBA)
 2100 FORMAT( 11X,A1,      I5,2H (,105A1,1H))
 2110 FORMAT( 11X,A1,6X,1H(,105A1,1H))
      RETURN
      END
```

```
      SUBROUTINE RANK(IREQ,IERR)
C*********************************************************************
C*********************************************************************
C
C   DECK 15  SUBROUTINE 'RANK'
C   THIS SUBROUTINE IS CALLED FROM THE MAIN ROUTINE TO DETERMINE THE
C   NORMALIZED DATASETS (ONE OR TWO) REQUIRED TO COMPUTE THE PROFILE
C   OUTPUT FOR EACH REQUESTED OUTPUT POWER SETTING (PSC OR PSCF). THE
C   INDICIES OF THESE NORMALIZED DATA ARE STORED IN ARRAY 'IREQ' FOR
C   EACH POWER SETTING.
C
C   SUBROUTINE ARGUMENT IERR IS RETURNED GREATER THAN ZERO WHEN ERRORS
C   OCCURRED IN THIS SUBROUTINE.
C
C*********************************************************************
C*********************************************************************
      DIMENSION IREQ(2,6),NR(6),NRI(6)
      COMMON M,MM,IL,IH,NC,L,N
      COMMON /HEADC/ TEST(6),TT(6,6),DATE,RUN(6),IPAGE,IVER,ACC,OPC(6),
     1 IT,P1,IHH,IT8,P8,IH8,FIMPR5,PV,CRI,PS(6,6),OPD(2,6),OPCC(6),DELN
     2, PSC(6),PSU,NP,PSIF(6),PSCF(6),NRC(6),ICC,OPCDM,OPD1,OPD2
     3, COMD(6),RUNC(6),IC,DATN(6),IFC(6),IFCC,IFI(6),IFII
      DATA FCT/0.001/,DUM/0.0/
C   CONVERT POWER SETTING DATA FROM 'A' FORMAT TO FLOATING POINT FORMAT.
      IERR=0
      DO 10 I=1,N
      DECODE(5,3000,PS(1,I)) PSIF(I)
C   OUTPUT POWER SETTING UNITS (PSU) MUST BE THE SAME AS IN THE REFERENCE
C   FILE!
      IF (PS(2,I) .NE. PSU) GO TO 25
   10 CONTINUE
      DO 20 I=1,NP
   20 DECODE(5,3000,PSC(I)) PSCF(I)
      GO TO 30
   25 WRITE(6,2000) ACC,OPC(I),PS(2,I),PSU
      IERR=3
      RETURN
C   INDICIES OF AFTERBURNER,WET AND WITH JETS 'PSIF' DATA (IFI>0) ARE
C   STORED IN 'NRI' BUT NOT RANKED.
   30 KK=0
      IF (IFII) 50,50,35
   35 DO 45 I=1,N
      IF (IFI(I)) 45,45,40
   40 KK=KK+1
      NRI(KK)=I
   45 CONTINUE
   50 KKI=KK
C   KKI --- NUMBER OF OPC'S WITH IFI>0 (KKI SHOULD =IFII).
C   RANK PSIF(I) DATA AND STORE INDEX OF PSIF OF RANK 'KK' IN NRI(KK);
C   RANK STARTS AFTER UNRANKED AFTERBURNER, WET AND WITH JETS DATA;
C   THAT IS, FIRST KK=KKI+1.
      IF (N .EQ. KKI) GO TO 110
      IF (N .GT. 1) GO TO 60
      NRI(1)=1
      GO TO 110
```

```
   50 N1=KKI+1
      DO 65 I=1,N
   65 NR(I)=N1
      N1=N-1
      DO 90 I=1,N1
      IF (IFI(I)) 70,70,90
   70 II=I+1
      DO 85 K=II,N
      IF (IFI(K)) 75,75,85
   75 IF (PSIF(I) .GT. PSIF(K)) GO TO 80
      NR(K)=NR(K)+1
      GO TO 85
   80 NR(I)=NR(I)+1
   85 CONTINUE
      KK=NR(I)
      NRI(KK)=I
   90 CONTINUE
      IF (IFI(N)) 100,100,110
  100 KK=NR(N)
      NRI(KK)=N
C  INDICIES OF AFTERBURNER,WET AND WITH JETS 'PSCF' DATA (IFC>0) ARE
C  STORED IN 'NRC' BUT NOT RANKED.
  110 KK=0
      IF (IFCC) 135,135,120
  120 DO 130 I=1,NP
      IF (IFC(I)) 130,130,125
  125 KK=KK+1
      NRC(KK)=I
  130 CONTINUE
C  KKC --- NUMBER OF PSC'S WITH IFC>0 (KKC SHOULD =IFCC).
  135 KKC=KK
      IF (NP .EQ. KKC) GO TO 220
C  RANK PSCF(I) DATA AND STORE INDEX OF PSCF OF RANK 'KK' IN NRC(KK);
C  RANK STARTS AFTER UNRANKED AFTERBURNER, WET AND WITH JETS DATA;
C  THAT IS, FIRST KK=KKC+1.
      IF (NP .GT. 1) GO TO 150
      NRC(1)=1
      GO TO 210
  150 N1=KKC+1
      DO 160 I=1,NP
  160 NR(I)=N1
      N1=NP-1
      DO 200 I=1,N1
      IF (IFC(I)) 170,170,200
  170 II=I+1
      DO 190 K=II,NP
      IF (IFC(K)) 180,180,190
  180 IF (PSCF(I) .GT. PSCF(K)) GO TO 185
      NR(K)=NR(K)+1
      GO TO 190
  185 NR(I)=NR(I)+1
  190 CONTINUE
      KK=NR(I)
      NRC(KK)=I
  200 CONTINUE
```

```
      IF (IFC(NP)) 205,205,210
  205 KK=NR(NP)
      NRC(KK)=NP
  210 IF (KKC) 260,260,220
C  DO LOOP 250 --- DETERMINE THE INDEX OF ARRAY PSIF (ALSO OPC, ETC.)
C  REQUIRED TO COMPUTE PSCF(IC) DATA AND STORE INDEX IN ARRAY IREQ(1,IC)
C  ONLY AFTERBURNER, WET OR WITH JETS DATA ARE CHECKED HERE.
  220 DO 250 IC=1,KKC
      ICC=NRC(IC)
      IREQ(1,IC)=0
      IREQ(2,IC)=0
      DO 230 IN=1,KKI
      IN1=NRI(IN)
      IF (ABS(PSCF(ICC)-PSIF(IN1)) .LT. FCT*PSIF(IN1)) GO TO 240
  230 CONTINUE
C  WRITE ERROR MESSAGE WHEN MATCH IS NOT FOUND.
      WRITE(6,2400) PSC(ICC),ACC
      IERR=4
      RETURN
  240 IREQ(1,IC)=IN1
  250 CONTINUE
      IF (KKC .EQ. NP) RETURN
C  DO LOOP 400 --- DETERMINE INDICIES OF ARRAY PSIF (ALSO OPC, ETC.)
C  REQUIRED TO COMPUTE PSCF(IC) DATA AND STORE INDICIES IN ARRAY
C  IREQ(1&2,IC) --- ALL NORMAL POWER CONDITION DATA ARE CHECKED HERE.
C  IF ONE OR MORE OF THE SAME REFERENCE DATASETS ARE REQUIRED TO COMPUTE
C  TWO CONSECUTIVE  PROFILE DATASETS, THEN IREQ(1,IC)=IREQ(1,IC-1) OR
C  IREQ(2,IC)=IREQ(2,IC-1) TO AVOID DUPLICATE COMPUTATION OF PROFILE
C  DATA.
  260 NP1=KKC+1
      IF (KKI .EQ. N) GO TO 500
      N1=KKI+1
      N2=N-1
      DO 400 IC=NP1,NP
      IC1=IC-1
C  ICC -- INDEX OF 'PSC' (OR PSCF) DATA OF RANK 'IC':
      ICC=NRC(IC)
      IREQ(1,IC)=0
      IREQ(2,IC)=0
      IF (N1.LT. N) GO TO 300
      IN2=NRI(N1)
      GO TO 320
  300 DO 310 IN=N1,N2
      IN1=NRI(IN)
      IN2=NRI(IN+1)
      IF (ABS(PSCF(ICC)-PSIF(IN1)) .LT. FCT*PSIF(IN1)) GO TO 340
      IF (PSCF(ICC) .GT. PSIF(IN1) .AND. PSCF(ICC) .LT. PSIF(IN2)) GO
     1 TO 330
  310 CONTINUE
  320 IF (ABS(PSCF(ICC)-PSIF(IN2)) .LT. FCT*PSIF(IN2)) GO TO 350
C  WRITE ERROR MESSAGE IF MATCH IS NOT FOUND.
      IN1=NRI(KKI+1)
      IERR=2
      WRITE(6,2300) IERR,ACC,PSCF(ICC),PSIF(IN1),PSIF(IN2)
      RETURN
```

```
  330 IF (IC-NP1) 360,360,335
C  LABELS 335 TO 355 -- CHECK TO DETERMINE IF THE SAME REFERENCE DATA
C  WERE USED FOR THE PREVIOUS 'IC'S
  335 IF (IN2 .EQ. IREQ(1,IC1) .OR. IN1 .EQ. IREQ(2,IC1)) GO TO 370
      GO TO 360
  340 IF (IC-NP1) 365,365,345
  345 IF (IN1 .EQ. IREQ(2,IC1)) GO TO 375
      GO TO 365
  350 IF (IC-NP1) 380,380,355
  355 IF (IN2 .EQ. IREQ(2,IC1)) GO TO 385
      GO TO 380
C  LABELS 360 TO 385 -- SET 'IREQ' EQUAL TO THE INDICIES OF THE
C  REFERENCE POWER SETTING DATA REQUIRED TO COMPUTE THE 'PSC(IC)'
C  DATA:
  360 IREQ(2,IC)=IN2
  365 IREQ(1,IC)=IN1
      GO TO 400
  370 IREQ(1,IC)=IN2
  375 IREQ(2,IC)=IN1
      GO TO 400
  380 IREQ(1,IC)=IN2
      GO TO 400
  385 IREQ(2,IC)=IN2
  400 CONTINUE
      RETURN
C  WRITE ERROR MESSAGE WHEN ALL IFI>0 FOR INPUT DATASETS BUT NOT ALL
C  IFC>0 FOR REQUESTED PROFILE DATA.
  500 IERR=1
      DO 510 IC=NP1,NP
      ICC=NRC(IC)
  510 WRITE(6,2300) IERR,ACC,PSCF(ICC),DUM,DUM
      RETURN
 2000 FORMAT('1   FOR ACC= ',A3,' AND OPC= ',A2/'    POWER SETTING UNITS
     1 READ FROM NORMALIZED DATASET DO NOT MATCH UNITS ON CODE SHEET'/
     2 '     PS(2,I)=',A6/'     PSU=',A6/
     3 '     ALL DATA FOR THIS ACC DELETED FROM THIS JOB.')
 2300 FORMAT('1   REQUESTED POWER SETTING DATA OUTSIDE RANGE OF AVAILABL
     1E INPUT DATA.'//'     SEE SUB. RANK --- IERR=',I2,'     DATA FOR ACC
     2= ',A3,' DELETED FROM THIS JOB.'//'     PSCF(ICC)= ',F11.5,
     3 ' AND MIN AND MAX INPUT POWER SETTINGS ARE ',F11.5,' AND ',
     4 F11.5,' RESPECTIVELY.')
 2400 FORMAT('1   REQUESTED AFTERBURNER, WET OR WITH JETS POWER SETTING
     1--- PSC= ',A5/'     DOES NOT MATCH POWER SETTING IN NORMALIZED REFE
     2RENCE FILE.'/ '     ALL DATA FOR AIRCRAFT CODE ',A3,' DELETED FROM
     3THIS JOB.')
 3000 FORMAT(F5.0)
      END
```

```
      SUBROUTINE SUMRY(IREQ,IEDIT,FMXER)
C*********************************************************************
C*********************************************************************
C
C  DECK 16  SUBROUTINE 'SUMRY'
C  THIS SUBROUTINE IS CALLED FROM THE 'MAIN' ROUTINE TO PRINT THE
C  OMEGA 11 SUMMARY PAGE WHICH LISTS JOB 'ID' PARAMETERS AS WELL AS A
C  SUMMARY OF THE INPUT AND OUTPUT DATA.
C
C  FOR IPR<1, THIS IS THE ONLY TAB OUTPUT.
C
C*********************************************************************
C*********************************************************************
      DIMENSION YN(2),IREQ(2,6),ANG(3)
      COMMON M,MM,IBNL,IBNH,NC, L,N,ID,DIST,MEAS(3)
      COMMON /HEADC/ TEST(6),TT(6,6),DATE,RUN(6),IPAGE,IVER,ACC,OPC(6),
     1 IT,P1,IHH,IT8,P8,IH8,FIMPR8,PV,CRI,PS(6,6),OPD(2,6),OPCC(6),DELN
     2, PSC(6),PSU,NP,PSIF(6),PSCF(6),NRC(6),ICC,OPCOM,OPD1,OPD2
     3,  COMD(6),RUNC(5),IC,DATN(5),IFC(6),IFCC,IFI(6),IFII
      DATA YN/3HNO ,3HYES/,ANG/3H NO,3H 10,3HALL/,BLK/1H /
      WRITE(6,2000) TEST(1),(TT(I,1),I=1,3)
      WRITE(6,2010) IVER,ACC,PV,CRI,DATE,DELN
      WRITE(6,2020)
C  PRINT SUMMARY OF REFERENCE DATA (INPUT) FOR EACH POWER SETTING:
      DO 50 L=1,N
   50 WRITE(6,2030) ACC,COMD(L),OPC(L),IFI(L),PS(1,L),PS(2,L),TEST(L),
     1 RUN(L),OPD(1,L),OPD(2,L)
      WRITE(6,2040)
      DO 60 L=1,N
   60 WRITE(6,2050) ACC,COMD(L),(TT(I,L),I=1,6),DATN(L)
C  START OUTPUT DATA SUMMARY:
      WRITE(6,2060)
      I1=1
      I2=1
      I3=1
      IF (MEAS(1) .GT. 0) I1=2
      IF (MEAS(2) .GT. 0) I2=2
      IF (MEAS(3) .GT. 0) I3=2
      WRITE(6,2070) YN(I1),YN(I2),YN(I3)
      IF (IEDIT) 70,80,90
   70 I1=1
      GO TO 100
   80 I1=2
      GO TO 100
   90 I1=3
  100 WRITE(6,2080) ANG(I1)
      IF (IEDIT) 110,105,110
  105 WRITE(6,2085) FMXER
  110 WRITE(6,2090) IT8,P8,IH8
      WRITE(6,2100) TEST(1),(TT(I,1),I=1,6)
      WRITE(6,2110)
C  PRINT PROFILE DATA SUMMARY FOR EACH POWER SETTING:
      DO 150 I=1,NP
      I1=NRC(I)
      I2=IREQ(1,I)
```

```
      I3=IWEQ(2,I)
      IF (I2 .EQ. 3) GO TO 120
      IF (I3 .EQ. 0) GO TO 130
      WRITE(6,2120) ACC,OPCC(I1),PV,CRI,OPCC(I1),RUNC(I),PSC(I1),
     1 PSU,ACC,COMD(I2),YN(1),ACC,COMD(I3)
      GO TO 150
  120 I2=I3
  130 WRITE(6,2120) ACC,OPCC(I1),PV,CRI,OPCC(I1),RUNC(I),PSC(I1),
     1 PSU,ACC,COMD(I2),BLK,BLK,BLK,OPD(1,I2),OPD(2,I2)
  150 CONTINUE
      WRITE(6,2130)
      RETURN
 2000 FORMAT(1H1, 9X,*SUMMARY OF I/O FOR TEST *,A10,*  FOR THE  *,2A9,A7
     1)
 2010 FORMAT(/10X,*PROGRAM:  OMEGA 11.*,I1/
     1  10X,*AIRCRAFT CODE: *,A3/ 10X,*PROFILE VERSION CODE: *,A1/
     2  10X,*COMDECK REVISION IDENTIFIER: *,A1/ 10X,*DATE: *,A10/
     3  10X,*DELTA N (OR DELN)=*,F6.2,* DB*)
 2020 FORMAT(//10X,31(1H*),* INPUT DATA *,31(1H*)
     1 /11X,*COMDECK*,8X, *FLAG     POWER*,9X,
     2  *TEST     RUN  POWER DESCRIPTION*/
     3  13X,*NAME   OPC    IFI     SETTING*,3X,2(6X,2HNO))
 2030 FORMAT(10X,*N*,A3,A4,3X,A2,  I6,3X,A5,1X,A6,2X,A10,2X,A2,2X,2A10)
 2040 FORMAT(/11X,*COMDECK  *,15(1H-),* NOISE SOURCE/SUBJECT *,15(1H-)
     1,*  DATE OF*/13X,*NAME   PART 1*,21X,*PART 2*,21X,*NORM. RUN*)
 2050 FORMAT(10X,*N*,A3,A4,2(2X,2A9,A7),2X,A10)
 2060 FORMAT(//10X,30(1H*),* OUTPUT DATA *,31(1H*))
 2070 FORMAT( 10X,*MEASURES COMPUTED:    PNLT(P)--*,A3,4X,*AL(A)--*,A3,
     1  4X,*ALT(T)--*,A3)
 2080 FORMAT(10X,*ANGLE SELECTION MODE:  PROFILE DATA FOR *,A3,
     1  * ANGLES WRITTEN ON FILE *TAPE2**)
 2085 FORMAT(10X,*MAX ERROR PERMITTED IN PROFILE DATA ANGLE SELECTION (F
     1ILE TAPE2)=*,F5.1,* DB*)
 2090 FORMAT(10X,*METEOROLOGY:  TEMP*,6X,*=*,I6,* F*/
     1  24X,*BAR PRESS =*,F6.2,* IN HG*/ 24X,*REL HUMID =*,I5,* %*)
 2100 FORMAT(/10X,*TEST NUMBER FOR ALL RUNS: *,A10/
     1 10X,*NOISE SOURCE/SUBJECT FOR ALL RUNS, PART 1: *,2A9,A7/
     2  45X,*PART 2: *,2A9,A7)
 2110 FORMAT(/10X,*PROFILE*, 7X,*RUN     POWER*,6X,
     1  *NORMALIZED COMDECKS  POWER DESCRIPTION*/
     2  12X,*ID*,5X,*OPC   NO    SETTING     FIRST      SECOND*)
 2120 FORMAT(10X,A3,A2,2A1,2(3X,A2),2X,A5,1X,A6,2X,*N*,A3,A4,2X,
     1  A1,A3,A4,3X,2A10)
 2130 FORMAT(//10X,26(1H*),* GENERAL INFORMATION *,27(1H*)/
     1  10X,*OPC --- OPERATION POWER CODE*/
     2 10X,*FLAG IFI=1 --- REFERENCE DATA ARE FOR AFTERBURNER, WET OR WI
     3TH JETS*/ 10X,*     IFI=0 --- NORMAL REFERENCE DATA WHICH CAN BE I
     4NTERPOLATED*/
     5 10X,*PROFILE COMDECK NAME = SYMBOL P, A OR T + PROFILE ID LISTED
     6ABOVE*)
      END
```

```
      SUBROUTINE EDIT(IRD,J1,J2,JI,ACC,PSC,PSU,FMXER)
C***********************************************************************
C***********************************************************************
C  DECK 17  SUBROUTINE 'EDIT'
C  THIS SUBROUTINE IS CALLED FROM THE 'MAIN' ROUTINE TO SELECT THE TEN
C  (0 AND 180 DEGREES PLUS 8 ANGLES IN BETWEEN) ANGLES FOR EACH MEASURE
C  (PNLT, AL, AND ALT) WHICH BEST DEFINE THE ANGLE VERSUS NOISE LEVEL
C  DATA FOR THAT MEASURE AT THE REFERENCE DISTANCE (250 FEET).
C
C***********************************************************************
C***********************************************************************
      DIMENSION TYPE(3)
      COMMON IDM(9),MEAS(3),FSPL(19,24,6),NR(17,3),NRA(17,8),ER(19,3),
     1 ERA(19,8),RMS(3),RMSA(8),DBC(19),DB(10),ANG(10),DUM(10),
     2 SENXD(19,22,12),SENX(19,3),SL(18,3),DSL(17,3),NRD(17,3)
      DATA TYPE/4HPNLT,4HAL  ,4HALT /, ERMAX/1.49/
C  ARRAY 'MEAS(3)' IS THE FLAG TO INDICATE MEASURES TO BE COMPUTED:
C        MEAS(1)>0 --- COMPUTE 'PNLT' DATA.
C        MEAS(2)>0 --- COMPUTE 'AL' DATA.
C        MEAS(3)>0 --- COMPUTE 'ALT' DATA.
      J=0
      JM=3
      DO 100 JJ=J1,J2,JI
      J=J+1
      SENX(1,J)=SENXD(1,IRD,JJ)
C  COMPUTE ANGLE TO ANGLE SLOPE:
      DO 30 I=2,19
      SENX(I,J)=SENXD(I,IRD,JJ)
      II=I-1
   30 SL(II,J)=SENX(I,J)-SENX(II,J)
C  COMPUTE CHANGES IN SLOPE:
      DO 35 I=2,18
      II=I-1
   35 DSL(II,J)=SL(I,J)-SL(II,J)
      DO 40 I=1,17
   40 NR(I,J)=1
C  RANK CHANGES IN THE SLOPES:
      DO 50 I=1,16
      II=I+1
      DO 50 K=II,17
      IF (ABS(DSL(I,J)) .GT. ABS(DSL(K,J))) GO TO 45
      NR(K,J)=NR(K,J)+1
      GO TO 50
   45 NR(I,J)=NR(I,J)+1
   50 CONTINUE
  100 CONTINUE
C   NR(I,J) CONTAINS RANK OF I-TH DSL.
C     WRITE(6,2000)
      ICK=0
C   'J' IS THE MEASURE INDEX:
      DO 200 J=1,3
C     WRITE(6,2100) TYPE(J),ACC,PSC,PSU,(I,I=10,180,10)
C     WRITE(6,2200) (SENX(I,J),I=1,19),(SL(I,J),I=1,18)
C     WRITE(6,2300) (DSL(I,J),I=1,17),(NR(I,J),I=1,17)
C     WRITE(6,2400)
```

```
      RMSMN=1000.0
C  COMPUTE 'RMS' OF ERROR USING ALL THREE SETS OF ANGLES FOR EACH
C  MEASURE.  THE 8 ANGLES WITH THE LARGEST CHANGE IN SLOPE
C  (PLUS 0 AND 180 DEGREE ANGLES) ARE SELECTED AND LINEAR INTERPOLATION
C  IS USED TO COMPUTE THE MEASURE DATA FOR THE REMAINING ANGLES.
C  THE ERROR IS THE DIFFERENCE BETWEEN ACTUAL DATA AND THE INTERPOLATED
C  DATA.
      DO 150 JR=1,3
      CALL ERR(J,JR,NR,RMS,ER,JM)
      IF (RMS(JR) .GE. RMSMN) GO TO 150
      RMSMN=RMS(JR)
      JMN=JR
  150 CONTINUE
C     WRITE(6,2120) JMN,(ER(I,JMN),I=1,19)
C     WRITE(6,2500) RMS
      DO 155 I=1,17
  155 NRD(I,J)=NR(I,JMN)
      RMS(J)=RMSMN
C  USING THE ANGLE SET WITH THE SMALLEST 'RMS' ERROR, SELECT THE
C  ANGLES WITH THE LARGEST ERRORS IN AN ATTEMPT TO IMPROVE THE ANGLE
C  SELECTION:
      CALL ITER(J,JMN,ICK,ERMAX,NRD)
C  AFTER 'ITER':
C         RMS(J) CONTAINS THE RMS DATA
C         ER(19,3) CONTAINS ERROR DATA.
C         NRD(17,3) CONTAINS RANK DATA
C         IF 'ICK'>0, CHANGES WERE MADE IN 'ER' AND 'NRD' IN SUB. 'ITER'.
  200 CONTINUE
      IF (ICK) 235,235,210
C  IF THE ANGLE SELECTION WAS CHANGED BY SUBROUTINE 'ITER' ABOVE
C  (ICK>0), RECOMPUTE THE 'RMS' ERROR FOR EACH ANGLE SET FOR EACH
C  MEASURE AND CALL SUBROUTINE 'ITER' AGAIN; IE., REPEAT
C  LABEL 200 LOOP COMPUTATIONS (IN LOOP 230):
  210 DO 230 J=1,3
      RMSMN=1000.0
      DO 220 JR=1,3
      CALL ERR(J,JR,NRD,RMS,ER,JM)
      IF (RMS(JR) .GE. RMSMN) GO TO 220
      RMSMN=RMS(JR)
      JMN=JR
  220 CONTINUE
      DO 225 I=1,17
  225 NR(I,J)=NRD(I,JMN)
C     WRITE(6,2500) RMS
C  'JMN=J' ITERATION HAS ALREADY BEEN COMPUTED ABOVE:
      IF (JMN .EQ. J) GO TO 230
      RMS(J)=RMSMN
      CALL ITER(J,JMN,ICK,ERMAX,NR)
  230 CONTINUE
  235 IHOR=0
C  COMPUTE THE FINAL ERROR AND 'RMS' ERROR DATA FOR EACH MEASURE;
C  ANGLES WITH RANK (NR OR NRD) > 9 ARE INCLUDED IN THE PROFILE DATASET
C  WRITTEN ON FILE 'TAPE2':
      DO 310 J=1,3
      IF (MEAS(J)) 310,310,240
```

```
  240 IF (ICK) 245,245,255
  245 DO 250 I=1,17
  250 NR(I,J) =NRD(I,J)
  255 CALL ERR(J,J,NR,RMS,ER,JH)
      IERR=0
C  CHECK FOR ERRORS GREATER THAN 'FMXER';  IF ERRORS OCCUR, PRINT
C  WARNING MESSAGES WITH ERROR AND RANK DATA.  THE DATA ARE USED
C  REGARDLESS OF THE MAGNITUDE OF THE ERRORS:
      DO 260 I=2,18
      IF (ABS(ER(I,J)) .LT. FMXER) GO TO 260
      IERR=IERR+1
  260 CONTINUE
C     IF (IERR) 300,300,270
      IF (IERR) 310,310,270
  270 IF (IHDR) 275,275,280
  275 IHDR=1
      WRITE(6,2000) ACC,PSC,PSU
  280 WRITE(6,2005) TYPE(J),FMXER
  300 WRITE(6,2110) (I,I=10,180,10)
      WRITE(6,2130) (NR(I,J),I=1,17)
      WRITE(6,2120) J,(ER(I,J),I=1,19)
  310 CONTINUE
C     WRITE(6,2500) RMS
      RETURN
 2000 FORMAT(*1AIRCRAFT CODE: *,A3,* POWER SETTING: *,A5,1X,A6)
 2005 FORMAT(//* FOR *,A4,* DATA, THE 10 ANGLES SELECTED RESULT IN ONE O
     1R MORE ERRORS GREATER THAN FMXER= *,F6.3/ * ANGLES SELECTED ARE 0
     2AND 180 PLUS 8 ANGLES WITH RANK > 9.*)
C2100 FORMAT(  //*    ID: *,A4,2X,A3,2X,A5,A6//* ANG     0*,18I7)
 2110 FORMAT(//* ANG     0*,18I7)
 2120 FORMAT(* ER*,I1,F6.1,18F7.1)
 2130 FORMAT( * RANK*,4X,17I7)
C2200 FORMAT(* DAT*,F6.1,18F7.1/* SL     *,18F7.2)
C2300 FORMAT(* DSL*,6X,17F7.2/* RANK*,4X,17I7)
C2400 FORMAT(1H )
C2500 FORMAT( 3X,*RMS1=*,F7.3,5X,*RMS2=*,F7.3,5X,*RMS3=*,F7.3)
      END
```

```
      SUBROUTINE  ERR(J,JA,NRA,RMSA,ERA,JM)
C*********************************************************************
C*********************************************************************
C
C  DECK 18  SUBROUTINE 'ERR'
C  THIS SUBROUTINE IS CALLED FROM SUBROUTINES 'EDIT' AND 'ITER'.
C  IT USES LINEAR INTERPOLATION TO COMPUTE THE MEASURE DATA FOR ANGLES
C  WITH RANK < 10, THEN COMPUTES THE ERROR AND 'RMS' ERROR BETWEEN THE
C  GIVEN DATA AND THIS INTERPOLATED DATA. NINE ANGLES ARE INTERPOLATED
C  FOR EACH SET.
C*********************************************************************
C*********************************************************************
      DIMENSION AG(19),NRA(17,JM),RMSA(JM),ERA(19,JM)
      COMMON IDM(9),MEAS(3),FSPL(19,24,6),NRER(407),DBC(19),DB(10),
     1 ANG(10),DUM(10),SENXD(19,22,12),SENX(19,3)
      DATA AG/0.,10.,20.,30.,40.,50.,60.,70.,80.,90.,100.,110.,120.,130.
     1, 140.,150.,160.,170.,180./
      K=1
C  SET ANGLE AND DB ARRAYS FOR ANGLES 0 AND 180 DEGREES:
      ANG(K)=0.0
      DB(K)=SENX(K,J)
      ANG(10)=180.0
      DB(10)=SENX(19,J)
      DO 50 I=1,17
      II=I+1
      IF (NRA(I,JA) .LT. 10) GO TO 50
      K=K+1
C  SET UP ANGLE AND DB ARRAYS FOR THE 8 SELECTED ANGLES:
      ANG(K)=AG(II)
      DB(K)=SENX(II,J)
   50 CONTINUE
      IF (K .NE. 9) WRITE(6,2000) K
 2000 FORMAT(//* ERROR IN K IN SUBROUTINE ERR---K=*,I4)
      SUM=0.0
C  USE SUBROUTINE 'FINTP' TO INTERPOLATE DB LEVEL FOR ANGLE AG(I),
C  THEN COMPUTE ERROR AND 'RMS' SUM:
      CALL FINTP(AG,DBC,ANG,DB)
      DO 70 I=1,19
      ERA(I,JA)=SENX(I,J)-DBC(I)
   70 SUM=SUM+ERA(I,JA)**2
C  COMPUTE 'RMS':
      RMSA(JA)=SQRT(SUM/9.0)
      RETURN
      END
```

```
      SUBROUTINE FINTP(AG,DBC,X,Y)
C*********************************************************************
C*********************************************************************
C
C   DECK 19  SUBROUTINE  'FINTP'
C   THIS SUBROUTINE IS CALLED FROM SUBROUTINE 'ERR' TO USE LINEAR
C   INTERPOLATION TO COMPUTE THE NOISE LEVELS (DBC) FOR THE 19 ANGLES
C   IN ARRAY 'AG'. THE GIVEN ANGLE DATA ARE IN ARRAY 'X' AND THE
C   CORRESPONDING NOISE LEVEL DATA ARE IN ARRAY 'Y'.
C
C   IT IS ASSUMED THAT 'X' AND 'AG' ARE BOTH INCREASING AND THAT
C   X(1)=AG(1)=0.0 DEGREES AND X(10)=AG(19)=180.0 DEGREES.
C
C*********************************************************************
C*********************************************************************
      DIMENSION X(10),Y(10),AG(19),DBC(19)
      DATA N/10/
      DBC(1)=Y(1)
      DBC(19)=Y(10)
      L=2
C   COMPUTE NOISE LEVEL FOR ANGLES FROM 10 TO 170 DEGREES:
      DO 100 J=2,18
C   'XI' IS THE ANGLE FOR WHICH THE NOISE LEVEL IS BEING COMPUTED:
      XI=AG(J)
   20 DIF=X(L)-XI
C   LABEL 50 BELOW -- NO INTERPOLATION REQUIRED:
      IF (ABS(DIF) .LT. 0.5) GO TO 50
      IF (DIF) 30,70,70
   30 L=L+1
C   L>N SHOULD NEVER OCCUR:
      IF (L .GT. N) GO TO 200
      GO TO 20
   50 DBC(J)=Y(L)
      GO TO 100
   70 L1=L-1
      DBC(J)=Y(L1)+(XI-X(L1))*(Y(L)-Y(L1))/(X(L)-X(L1))
  100 CONTINUE
      RETURN
  200 WRITE(6,2000)
 2000 FORMAT(1H1,20(1H*),' ERROR IN SUB. FINTP---ARRAYS AG OR X ARE INCO
     1RRECT. ',20(1H*))
      RETURN
      END
```

```
      SUBROUTINE ITER(J,JMN,ICK,ERMAX,NRD)
C*************************************************************************
C*************************************************************************
C
C  DECK 20  SUBROUTINE 'ITER'
C  THIS SUBROUTINE IS CALLED FROM SUBROUTINE 'EDIT' TO SELECT THE
C  ANGLES WITH THE LARGEST ERROR > 'ERMAX' AND DELETE THE ANGLES WHICH
C  RESULT IN THE SMALLEST 'RMS' ERROR. A MAXIMUM OF 5 LARGE ANGLES ARE
C  SELECTED, ONE AT A TIME.
C
C*************************************************************************
C*************************************************************************
      DIMENSION NRD(17,3)
      COMMON IDM(9),MEAS(3),FSPL(19,24,6),NRDM(17,3),NRA(17,8),ER(19,3),
     1 ERA(19,8),RMS(3),RMSA(8)
      JM=8
C  PERFORM 5 ITERATION SETS REPLACING ANGLES > ERMAX; IN MOST CASES
C  THERE ARE FEWER THAN 5 ANGLES WITH ERROR > ERMAX:
      DO 190 IRP=1,5
      ERMX=-1.0
C  DETERMINE THE MAXIMUM ERROR (ERMX) AND THE CORRESPONDING ANGLE
C  INDEX (IMX):
      DO 160 I=2,18
      D1=ABS(ER(I,JMN))
      IF (D1 .LE. ERMX) GO TO 160
      ERMX=D1
      IMX=I
  160 CONTINUE
C  IMXRK -- INDEX OF MAXIMUM ERROR IN RANK ARRAY (NRA OR NRD):
      IMXRK=IMX-1
      IF (ERMX .LT. ERMAX) RETURN
      ICK=1
      RMSMN=1000.0
C  SELECT 'IMX' ANGLE AND DELETE ANGLES WITH RANK 10 TO 17 ONE AT A
C  TIME TO DETERMINE THE MINIMUM 'RMS':
      DO 170 II=1,8
      IRK=II+9
      DO 165 I=1,17
      NRA(I,II)=NRD(I,J)
      IF (NRD(I,J) .EQ. IRK) NRA(I,II)=0
  165 CONTINUE
      NRA(IMXRK,II)=IRK
C  COMPUTE ERROR DATA:
      CALL  ERR(J,II,NRA,RMSA,ERA,JM)
      IF (RMSA(II) .GE. RMSMN) GO TO 170
      II1=II
      RMSMN=RMSA(II)
  170 CONTINUE
      IF (RMSMN .GE. RMS(J)) GO TO 185
C  IF RESULTING 'RMSMN' IS LESS THAN THE ORIGINAL 'RMS' FOR THE J-TH
C  MEASURE, REDEFINE 'ER', 'NRD', AND 'RMS' ARRAYS WITH THE REVISED
C  DATA:
      DO 175 I=1,19
  175 ER(I,JMN)=ERA(I,II1)
      DO 180 I=1,17
```

```
  180 NRD(I,J)=NRA(I,II1)
      RMS(J)=RMSMN
      WRITE(6,2600) IRP,RMSMN,(NRA(I,II1),I=1,17),II1,(ER(I,JMN),I=1,19)
      GO TO 190
  135 ER(IMX,JMN)=0.0
      WRITE(6,2610) IRP,RMSMN
  190 CONTINUE
      RETURN
 2600 FORMAT(* RMSA*,I1,*=*,F7.3/* RANK*,4X,17I7/ * ERA*,I1,F5.1,18F7.1)
 2610 FORMAT(* RMSA*,I1,*=*,F7.3,5X,*NO IMPROVEMENT*)
      END
```

I N D E X

```
                              ********** SUPER INDEX **********

SYMBOL   - ==================  ROUTINES IN WHICH THE SYMBOL IS USED  ==================

A1       -  PLT
A2       -  PLT
A6       -  PPFDAT
ABC      -  ALPH
ABS      -  CPTC      EDIT      FINTP     ICV       ITER      OMEGA11   RANK      TESTN
ACC      -  EDIT      HEADS     OMEGA11   PPFDAT    RANK      RSPLN     SUMRY     TESTN
            TITPG
AG       -  ERR       FINTP
AID      -  PLT
AL       -  CAL
ALD      -  CAL
ALN      -  ALPH
ALOG10   -  CAL       CDIST     CPNL      OMEGA11
ALPH     -  TESTN
ALTX     -  CDIST
ALX      -  CDIST
AMAX1    -  CPNL      PLT
AMX      -  CPNL      CPTC      PLT
ANG      -  ERR       SUMRY
ASK      -  OMEGA11   RSPLN     TESTN
ASK3     -  OMEGA11
ATKN     -  ALPH
ATN      -  TESTN
ATN3     -  CDIST     TESTN
ATNC     -  CDIST     TESTN
AW       -  CAL
BLK      -  HEADS     OMEGA11   PLT       PPFDAT    SUMRY     TESTN     TITPG
C        -  CPTC
C1       -  CDIST
CAL      -  CDIST
CD       -  RSPLN
CDIST    -  OMEGA11
CKEY     -  PPFDAT
COMD     -  PPFDAT    RSPLN     SUMRY
CPNL     -  CDIST
CPTC     -  CDIST
CRI      -  PPFDAT    SUMRY     TESTN
CXD      -  CDIST
```

I N D E X

```
                          ********** SUPER INDEX **********

D        -  OMEGA11
D1       -  CDIST     ITER      OMEGA11
D2       -  CDIST
D3       -  CDIST
DACC     -  OMEGA11   RSPLN
DATE     -  HEADS     OMEGA11   PPFDAT    SUMRY     TITPG
DATN     -  RSPLN     SUMRY
DB       -  ERR
DBC      -  ERR       FINTP
DD       -  ICV
DDATN    -  RSPLN
DELN     -  HEADS     OMEGA11   SUMRY     TESTN
DELND    -  OMEGA11
DFMXER   -  OMEGA11
DIF      -  FINTP
DIST     -  CDIST     OMEGA11   PLT
DKEY     -  PPFDAT
DOPC     -  RSPLN
DOT      -  PLT
DRUN     -  RSPLN
DSL      -  EDIT
DTEST    -  RSPLN
DUM      -  RANK
EA       -  CDIST
EAD      -  CDIST
EDIT     -  OMEGA11
EOF      -  RSPLN     TESTN
ER       -  EDIT      ITER
ERA      -  ERR       ITER
ERMAX    -  EDIT      ITER
ERMX     -  ITER
ERR      -  EDIT      ITER
EX       -  TESTN
F        -  ALPH      CPTC
FCT      -  RANK
FIMPRB   -  OMEGA11   TESTN
FINTP    -  ERR
FJ       -  CDIST     CPNL
FL       -  FNOY
FLOAT    -  CDIST     ICV       OMEGA11   TESTN
```

I N D E X

```
                    ********** SUPER INDEX **********

FM      -  FNOY
FMT     -  PPFDAT
FMXER   -  EDIT      OMEGA11   SUMRY
FN      -  CPNL      OMEGA11
FNOY    -  CPNL
FREQ    -  ALPH      OMEGA11
FREQ3   -  ALPH
FSPL    -  CDIST     OMEGA11   RSPLN
FT1     -  ALPH
FT2     -  ALPH
HA      -  ALPH
HEADS   -  OMEGA11   PLT       PPFDAT
HMX     -  ALPH
HN      -  ALPH
I       -  ATKN      CAL       CDIST     CPNL      CPTC      EDIT      ERR       HEADS
           ITER      OMEGA11   PLT       PPFDAT    RANK      RSPLN     SUMRY     TESTN
           TITPG
I1      -  ATKN      SUMRY
I2      -  SUMRY
I3      -  SUMRY
IA      -  PLT       PPFDAT
IAC     -  PPFDAT
IBNH    -  CAL       CDIST     CPNL      CPTC
IBNL    -  CAL       CDIST     CPNL      CPTC
IC      -  HEADS     OMEGA11   PPFDAT    RANK
IC1     -  OMEGA11   RANK
ICC     -  HEADS     OMEGA11   PPFDAT    RANK
ICD     -  PPFDAT
ICH     -  RSPLN
ICHD    -  RSPLN
ICK     -  EDIT      ITER
ICOM    -  RSPLN
ICT     -  CPTC
ICV     -  OMEGA11   PLT
ID      -  HEADS     OMEGA11
IDIST   -  PPFDAT
IEDIT   -  OMEGA11   PPFDAT    SUMRY
IERR    -  EDIT      OMEGA11   RANK      RSPLN
IFC     -  OMEGA11   RANK      TESTN
IFCC    -  OMEGA11   RANK      RSPLN     TESTN
```

I N D E X

```
                    ********** SUPER INDEX **********

IFI     -  OMEGA11   RANK      RSPLN     SUMRY
IFII    -  OMEGA11   RANK      RSPLN
IH      -  ALPH      OMEGA11   RSPLN     TESTN
IH1     -  CPTC
IH8     -  HEADS     PPFDAT    SUMRY     TESTN
IHDR    -  EDIT
IHH     -  HEADS     TESTN
II      -  CAL       CDIST     CPNL      EDIT      ERR       ITER      OMEGA11   PLT
           PPFDAT    RANK
II1     -  ITER
IL      -  ALPH      OMEGA11   RSPLN     TESTN
IL1     -  CPTC
IL2     -  CPTC
IL3     -  CPTC
ILL     -  CPTC
IMX     -  ITER
IMXRK   -  ITER
IN      -  RANK
IN1     -  RANK
IN2     -  RANK
INPUT   -  OMEGA11
IP      -  HEADS
IPAGE   -  HEADS     OMEGA11
IPH     -  HEADS
IPR     -  OMEGA11   PPFDAT
IPRCK   -  OMEGA11
IR      -  OMEGA11
IRD     -  CDIST     EDIT      OMEGA11   PLT
IREQ    -  OMEGA11   RANK      SUMRY
IRK     -  ITER
IRP     -  ITER
ISIGN   -  ICV
IT      -  HEADS     TESTN
IT8     -  HEADS     PPFDAT    SUMRY     TESTN
ITER    -  EDIT
IVER    -  HEADS     OMEGA11   PPFDAT    SUMRY     TITPG
IX      -  PLT
J       -  ALPH      ATKN      CAL       CDIST     CPNL      CPTC      EDIT      ERR
           FINTP     ITER      OMEGA11   PLT       PPFDAT    RSPLN
J1      -  EDIT      OMEGA11   PLT       PPFDAT
```

I N D E X

********** SUPER INDEX **********

I N D E X

********** SUPER INDEX **********

```
NPM     -  OMEGA11   TESTN
NR      -  EDIT      OMEGA11   PPFDAT    RANK
NRA     -  ERR       ITER
NRC     -  OMEGA11   RANK      SUMRY
NRD     -  EDIT      ITER
NRI     -  RANK
OPC     -  HEADS     OMEGA11   RANK      RSPLN     SUMRY
OPCC    -  OMEGA11   PPFDAT    SUMRY     TESTN
OPCCD   -  TESTN
OPCDM   -  HEADS     PPFDAT
OPCSP   -  RSPLN
OPD     -  HEADS     PPFDAT    RSPLN     SUMRY
OPD1    -  HEADS     PPFDAT
OPD2    -  HEADS     PPFDAT
OUTPUT  -  OMEGA11
P       -  PLT
P1      -  HEADS     TESTN
P8      -  HEADS     PPFDAT    SUMRY     TESTN
PAG     -  HEADS
PAGE    -  HEADS
PLT     -  OMEGA11
PNL     -  CPNL
PNLTX   -  CDIST
PNLX    -  CDIST     OMEGA11
PPFDAT  -  OMEGA11
PS      -  HEADS     OMEGA11   PPFDAT    RANK      RSPLN     SUMRY
PSC     -  EDIT      HEADS     OMEGA11   PPFDAT    RANK      SUMRY     TESTN
PSCF    -  OMEGA11   RANK
PSIF    -  OMEGA11   RANK
PSU     -  EDIT      HEADS     OMEGA11   PPFDAT    RANK      SUMRY     TESTN
PTC     -  CDIST     CPTC
PV      -  HEADS     PPFDAT    SUMRY     TESTN     TITPG
R       -  ICV       PPFDAT
RANK    -  OMEGA11
REL     -  ALPH
RETURN  -  ALPH      ATKN      CAL       CDIST     CPNL      CPTC      EDIT      ERR
           FINTP     FNOY      HEADS     ICV       ITER      PLT       PPFDAT    RANK
           RSPLN     SUMRY     TESTN     TITPG
RMS     -  EDIT      ITER
RMSA    -  ERR       ITER
```

INDEX

********** SUPER INDEX **********

```
RMSMN    -  EDIT      ITER
RP       -  PPFDAT
RSPLN    -  OMEGA11
RUN      -  OMEGA11   RSPLN     SUMRY
RUNC     -  HEADS     OMEGA11   PPFDAT    SUMRY
S        -  CPTC
S17      -  HEADS
S18      -  HEADS
S19      -  HEADS
S1C      -  HEADS
SA       -  CPTC
SAV      -  PLT
SENX     -  CDIST     EDIT      ERR       OMEGA11   PLT       PPFDAT
SENXO    -  EDIT
SL       -  EDIT
SP       -  CPTC
SPL      -  CPTC      FNOY
SPLL     -  CPNL
SPLP     -  CPTC
SPLPP    -  CPTC
SPLX     -  CAL       CDIST     CPNL      CPTC      OMEGA11   PPFDAT
SQRT     -  ERR       TESTN
STOP     -  OMEGA11
SUM      -  CPNL      ERR
SUMRY    -  OMEGA11
SX       -  CDIST     OMEGA11
SXK      -  CDIST
SYM      -  PLT
SYSTEM   -  ATKN
T        -  TITPG
T12      -  PPFDAT
T6       -  PPFDAT
TAPE2    -  OMEGA11
TAPE5    -  OMEGA11
TAPE6    -  OMEGA11
TAPE7    -  OMEGA11
TEMP     -  ALPH
TEST     -  HEADS     OMEGA11   PPFDAT    RSPLN     SUMRY     TITPG
TESTN    -  OMEGA11
TITPG    -  OMEGA11
```

```
I N D E X
                            ********** SUPER INDEX **********

 TM       -  TESTN
 TMB      -  TESTN
 TT       -  HEADS     PPFDAT    RSPLN     SUMRY     TITPG
 TYPE     -  EDIT      OMEGA11
 W        -  TESTN
 X        -  ALPH      ATKN      FINTP
 XI       -  ATKN      FINTP
 XX       -  ATKN
 Y        -  ALPH      ATKN      FINTP
 YN       -  SUMRY
 YY       -  ATKN
 ZERO     -  TESTN

 ******************************************************************************************

                                     I N D E X
                                END OF COMPUTATION,
                               1 DECEMBER 1967 VERSION.
                   (PROGRAM INDEX COPYRIGHT 1966, HARRY M. MURPHY, JR.)
```

REFERENCES

1. Bishop, D.E. Community Noise Exposure Resulting From Aircraft Operations: Acquisition and Analysis of Aircraft Noise and Performance Data, AMRL-TR-73-107, Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, OH, 1975.

2. "Standard Values of Atmospheric Absorption As A Function of Temperature and Humidity", SAE Aerospace Recommended Practice 866A, Society of Automotive Engineers, Warrendale, PA, 1975.

3. Cole, J.N., USAF Bioenvironmental Noise Data Handbook, Volume 1: Organization, Content, and Application, AMRL-TR-75-50(1), Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, OH, 1975.

4. "Noise Standards: Aircraft Type Certification", Federal Aviation Regulations, Part 36, December 1969.

5. "Definitions and Procedures For Computing The Perceived Noise Level of Aircraft Noise", SAE Aerospace Recommended Practice 865A, Society of Automotive Engineers, Warrendale, PA, 1969.

6. Kryter, K.D., The Effects of Noise on Man, Academic Press, New York, 1970.

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*U.S. Government Printing Office: 1983 — 659-005/2039

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Cont.

AD-A127 419 COMPUTER PROGRAMS FOR PRODUCING SINGLE-EVENT AIRCRAFT NOISE DATA FOR SPEC...(U) DAYTON UNIV OH RESEARCH INST H T MOHLMAN APR 83 UDR-TR-82-30 AFAMRL-TR-83-020 5/5

UNCLASSIFIED F33615-78-C-0500 F/G 1/5 NL

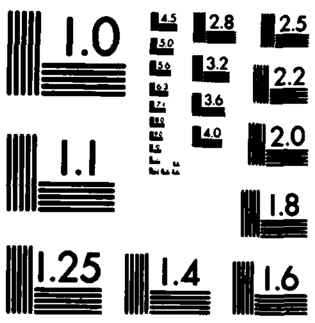
SUPPLEMENTARY

INFORMATION

END

DATE FILMED

8



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

SUPPLEMENTARY

INFORMATION

ERRATA FOR AFAMRL-TR-83-020
JANUARY 1987

ROGRAMS FOR PRODUCING SINGLE-EVENT AIRCRAFT
FOR SPECIFIC ENGINE POWER AND METEOROLOGICAL
S FOR USE WITH USAF COMMUNITY NOISE MODEL
(NOISEMAP)

ing changes apply to the OMEGA 10.5 documentation:

23 - change EA(13,13) to EA(22,24) where
,24) is the excess atmospheric attenuation in dB
ands 17 to 40 and distances 200 to 25,000 feet.

41 - In the third paragraph change 800 Hz to
0 Hz and change 400 and 6300 feet to 200 and
0 feet, respectively. These EA data are
nted in Table 7 which is included with this
a. They were taken from AFAMRL-TR-84-017
rence 8).

44 and 45 - In the section Adjust SPL Spectra
round-to-Ground Propagation replace the first
ion with:

$$SPLX_{I,J} = SPLX_{I,J} - EA_{I,J}$$

:

= the distance index defined for all 22 distances;

= the frequency band index defined for bands 17 through 40;

= excess attenuation in dB for the I^{th} distance and the J^{th} frequency.

the second equation and the last three lines in
ragraph.

(4)

The

(1)

(2)

(3)

REFE

(8)

(4) Pages 58 to 60 - the following change applies to item (6a) and (6d). A minor change was also made in the extrapolation criteria in that now all requested output power settings (PSC) for operation power codes 04, 05, 06, 07 and 13 must be less than or equal to the reference file takeoff power setting. The takeoff power must be used as the reference (OPCR) for all requested PSC values greater than the reference file takeoff power setting.

The following changes apply to the OMEGA 11.2 documentation:

(1) Page 74 - change EA(13,13) to EA(22,24) where EA(22,24) is the atmospheric attenuation in dB for bands 17 to 40 and distances 200 to 25000 feet.

(2) Page 93 - In the first paragraph, change 800 Hz to 10,000 Hz and change 400 and 6300 feet to 200 and 25,000 feet, respectively. These EA data are presented in Table 7 which is included with this errata. They were taken from AFAMRL-TR-84-017 (Reference 8).

(3) Page 93 - EAD is defined as the excess atmospheric attenuation of sound in dB over distance SX_K for frequency band index J where SX_K and J are defined for all standard distances and bands. The EA data are in the data statement array and $EAD = EA_{K,J}$.

REFERENCES:

(8) Bishop, D.E., Overground Excess Sound Attenuation (ESA), Volume 3: Application of ESA Data in NOISEMAP, AFAMRL-TR-84-017 - Volume 3, Air Force Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, OH, April 1985.

TABLE 7

EXCESS SOUND ATTENUATION(8)

ESA (DB)
DISTANCE FROM SOURCE IN FEET

BN	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000	20000	25000
17	0	0	0.85	0.93	0.78	0.48	0.12	-0.25	-0.44	-1.16	-1.60	-1.99	-2.20	-2.10	-1.66	-1.27	-1.27	-1.27	-1.27	-1.27	-1.27	-1.27
18	0	0	1.00	1.41	1.19	0.90	0.54	0.15	-0.29	-0.81	-1.25	-1.57	-1.61	-1.13	-0.08	0.98	0.98	0.98	0.98	0.98	0.98	0.98
19	0	0	0.25	0.44	0.56	.06	-0.20	-0.44	-0.72	-0.98	-1.11	-1.03	-0.56	0.53	2.15	3.79	3.79	3.79	3.79	3.79	3.79	3.79
20	0	0	0.50	1.53	1.36	1.17	1.01	0.89	0.86	1.01	1.41	2.15	3.34	5.02	6.75	8.05	8.05	8.05	8.05	8.05	8.05	8.05
21	0	0	0.75	2.16	2.29	2.49	2.79	3.21	3.83	5.13	5.99	7.54	9.47	11.55	13.00	13.12	13.12	13.12	13.12	13.12	13.12	13.12
22	0	0	1.00	2.29	3.50	4.97	6.71	8.53	10.48	12.67	14.57	16.22	17.58	18.51	19.13	19.13	19.13	19.13	19.13	19.13	19.13	19.13
23	0	0	1.60	4.44	6.85	9.69	12.93	16.10	19.20	22.19	24.10	24.90	24.68	23.22	22.76	22.76	22.76	22.76	22.76	22.76	22.76	22.76
24	0	0	4.50	11.69	13.63	15.90	18.46	20.94	23.30	25.48	26.69	26.28	25.90	24.10	23.10	23.10	23.10	23.10	23.10	23.10	23.10	23.10
25	0	0	7.00	13.06	14.50	16.39	18.25	18.67	19.02	19.25	19.21	18.88	18.23	17.38	16.74	16.10	15.62	15.06	15.00	15.00	15.00	15.00
26	0	0	5.00	10.71	12.20	14.13	15.58	15.93	16.22	16.42	16.41	16.16	15.66	14.97	14.33	13.50	12.67	11.84	11.50	11.25	11.25	11.25
27	0	0	4.20	8.74	10.23	12.00	12.50	12.64	12.75	12.77	12.67	12.39	11.92	11.25	10.53	9.57	8.61	7.65	7.10	7.00	7.00	7.00
28	0	0	3.30	7.33	8.64	9.38	9.33	9.24	9.13	8.94	8.71	8.40	7.97	7.40	6.72	5.82	4.92	4.02	3.70	3.70	3.70	3.70
29	0	0	2.10	5.39	6.40	6.58	6.54	6.45	6.32	6.08	5.77	5.36	4.84	4.31	3.80	3.26	2.64	2.02	2.00	2.00	2.00	2.00
30	0	0	1.20	3.09	3.93	4.25	4.30	4.31	4.28	4.17	3.96	3.63	3.17	2.60	2.06	1.37	0.68	-0.01	-0.25	-0.25	-0.25	-0.25
31	0	0	0.25	1.31	2.06	2.50	2.70	3.03	3.24	3.36	3.31	3.03	2.46	1.59	0.65	-0.36	-1.37	-2.38	-2.80	-3.00	-3.00	-3.00
32	0	0	0.00	0.16	0.86	1.71	2.69	3.10	3.11	3.02	2.81	2.48	1.76	0.76	-0.48	-2.09	-3.70	-5.31	-5.80	-6.00	-6.00	-6.00
33	0	0	-0.50	-1.58	-0.94	-0.15	0.80	1.81	2.80	2.71	2.43	1.87	0.91	-0.57	-2.46	-4.35	-6.24	-8.13	-8.90	-8.90	-8.90	-8.90
34	0	0	-0.75	-1.34	-0.75	-0.03	0.84	1.75	2.71	2.57	2.39	2.01	1.37	-0.39	-0.87	-2.13	-3.39	-4.65	-4.70	-4.90	-4.90	-4.90
35	0	0	0.00	0.53	1.03	1.67	1.88	2.03	2.51	2.44	2.34	2.17	1.84	1.34	0.72	.00	-0.55	-1.10	-1.30	-1.30	-1.30	-1.30
36	0	0	0.75	1.92	2.03	2.15	2.25	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
37	0	0	0.75	1.92	2.03	2.15	2.25	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
38	0	0	0.75	1.92	2.03	2.15	2.25	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
39	0	0	0.75	1.92	2.03	2.15	2.25	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
40	0	0	0.75	1.92	2.03	2.15	2.25	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30

ALL ESA DATA FOR BANDS LESS THAN BAND 17 ARE THE SAME AS FOR BAND 17 FOR EACH DISTANCE.

ALL ESA DATA FOR BANDS GREATER THAN BAND 40 ARE THE SAME AS FOR BAND 40 FOR EACH DISTANCE.

ALL ESA DATA FOR DISTANCES GREATER THAN 25000 FEET ARE THE SAME AS FOR 25000 FEET FOR EACH BAND.

ALL ESA DATA ARE 0 FOR ALL DISTANCES LESS THAN OR EQUAL TO 250 FEET.

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